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Developing a conceptual managerial model to minimise organisational politics at State-owned electricity providers in emerging markets

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Keywords

Organisational politics, managerial behaviour, state-owned enterprise, electricity crisis, Zimbabwe, factor analysis, political behaviour, managerial effectiveness, SADC utilities.

Abstract

Electricity is a fundamental driver of economic development, yet state-owned electricity providers in the Southern African Development Community (SADC) have struggled with chronic power generation shortfalls for nearly three decades. This crisis, particularly pronounced in Zimbabwe, is increasingly attributed to rampant organisational politics. This study investigates employee perceptions and the effects of organisational politics on state-owned electricity utilities and explores managerial practices aimed at minimising such negative political behaviours. A quantitative research approach was adopted, using a structured Likert-scale questionnaire distributed to a randomly selected sample of 1,400 employees from a population of 2,210. Of the returned 358 questionnaires, 347 were valid, yielding a 24.78% effective response rate. Data analysis was conducted using SPSS 21.0, and exploratory factor analysis was performed to develop a conceptual framework. The results identified four key political behaviour factors: managerial behaviour, poor communication of objectives, unexpected employee actions, and unhealthy managerial practices. Additionally, three consequences of organisational politics and two clusters of managerial mitigation strategies—fairness and participation—were extracted. The study proposes a conceptual model to manage organisational politics in Zimbabwe's electricity sector, with potential applicability to other state-owned utilities across the SADC region. The model underscores the imperative for political sensitivity, transparent communication, and inclusive managerial practices to improve organisational performance and energy delivery.

Introduction

The world is in deep electricity generation crisis that dates to the 20th century (Guan, Yan, Shan, Zhou, Hang, Li, Liu, Nie, Bruckne, Feng & Hubacek, 2023) with Africa suffering the worst electricity challenges, yet Africa has the largest energy resources that remain untapped since time immemorial. Considering that economies the world over are driven by electricity, Africa's economies are likely to continue surging as most of its countries struggle to increase power generation. Electricity is a basic need for powering industries and service organisation as well as for daily domestic uses. Without electricity, the level of development some countries are enjoying would not be a reality. Having said this, it is critical to point out that, most if not all electricity companies in Africa are state organisations, suggesting that government, to an extent, influences the day-to-day management of such strategic companies. Unfortunately, most of the companies have proved beyond reasonable doubt that they cannot generate adequate power for their economies with the Southern African Community (SADC) countries being especially hard hit. Although the study refers to SADC, the empirical analysis was performed on Zimbabwe. In a state-owned organisation, it is obvious that government involvement will have an influence on the day-to-day management practices, system operations and procedures that tend to affect the smooth flow of work. The matrix between government as the overseer and the management structure at the national electricity provider will obviously become part and parcel of the organisational politics that prevails in state-controlled organisations. Such is the situation in which state-organisations find themselves in.

Organisational politics is no newcomer to the managerial practice environment as well as to academia. For more than four decades empirical studies on managerial practices have focused largely on issues related to power and politics of the organisation (Drory & Vigoda-Gadot, 2010). In support Ullah, Jafri and Dost (2011) state that organisational politics has received a great deal of attention over the past decades due to its image of pervasiveness, mystery and the potential benefits that accrue to those who successfully play the

political game. Despite the extent of current research in the field of organisational politics, there are still scanty empirical studies on organisational politics within electricity companies across Africa, and yet organisational politics is rampant and rife across national electricity providers within (SADC). It is critical to set the record clear from the onset that organisational politics in national electricity providers of SADC cannot be viewed in isolation from government politics for the simple reason that national electricity providers are state-owned institutions which are by and large under the control of the respective government ministry, usually the ministry for energy resources.

Organisational politics is an inevitable phenomenon which has the potential to either make or rip the organisation apart. The study was, therefore, triggered by the prevalence of organisational politics in most national electricity providers against a background of mediocre performance. Most, if not all national electricity providers in SADC, are currently struggling to power their economies, with fingers being pointed at the insurgency of organisational politics as a major contributing force of late, posing as a threat to the future of the SADC region in making meaningful contribution to Africa's economy possibly due to inadequate electrical power. The SADC region is faced with a crisis and South Africa, the region's major player, experienced the worst electrical power crisis in 2008, leading to load shedding in most of its towns and cities (Kaseke & Hosking, 2011). Kaseke and Hosking (2011) further reports that the region relies on Mozambique's vast gas and coal deposits as well as massive hydro-electric power as a potential, to alleviate the crisis set to worsen in the next few years. At the time of study, Mozambique supplies hydro and gas power to South Africa and Zimbabwe while work is at an advanced stage to connect Malawi and Tanzania to its national power grid to curtail the power generation crisis that has economically crippled the SADC region. Taking its cue from the rife politicised environment engulfing state utilities that include national electricity providers across SADC, there is every reason to suggest that organisational politics has a physical hand in SADC's electricity crisis. However, despite rampant organisational politics within most of SADC's national electricity providers, there has been meaningful action towards the construction of energy power projects to alleviate the crisis.

The coincidence of organisational politics and the electricity crises in most of SADC's national electricity providers cannot be overlooked as it is likely to impact on organisational management. Thus, it is critical to what organisational politics is, as it forms the crux of the study. Organisational politics refers to the existence of multiple interests and incompatible goals, beyond the goals of the organisation and the influence used by organisation members to defend such goals (Ullah et al., 2011). The term organisational politics can be used interchangeably with terms such as political behaviour, political skill, influence tactics; politicking and political manoeuvring just to mention a few. Ullah et al. (2011) further portray organisational politics as resembling the influence processes enacted to manage the multiple competing interests' existent in organisations. In the early years, Pfeffer (1992) defined organisational politics as the activities taken within the organisations to acquire, develop and use power and other resources to obtain one's preferred outcomes in a situation where there is uncertainty or dis-census about choices. To date this definition is still relevant and applicable to contemporary organisational developments as echoed by Kurchner-Hawkins and Miller (2016) when they summarily perceive organisational politics as an exercise of power and influence that primarily occurs outside the formal organisational processes and procedures with a goal of furthering one's interests.

The prevalence of organisational politics is an unavoidable development for the simple reason that, organisations are by nature political arenas where battles are fought, won, or lost (Gotsis & Kortezi, 2011). In the process of political battles, the functioning of the organisation is to a large extent negatively affected. Veluri (2019) defines an organisation as a group of individuals, who come together to realise their goals. In essence, an organisation is regarded as a social marketplace where individuals engage in transactions/activities to obtain favourable returns. Jones and George (2019) define an organisation as a collection of people who work together and coordinate their actions to achieve desired future outcomes. Taking queue from the above description of an organisation, national electricity providers across SADC depict such description. These are typical organisations which by their very nature of them having goals and employees with deferring goals. However, the mysterious actions from all the organisation members in pursuit of individual goal achievement mark the brewing point of organisational politics which is the crux of the study. The state-owned electricity providers in the SADC region have struggled to power their respective economies for almost three decades without any improvement. The intensity of the power crises differs from

country to country with Zimbabwe experiencing the worst crisis since attaining independence from Britain in the 1980s (Kaseke & Hosking, 2011). The fact that the state-owned electricity providers are state-owned entities suggests that the respective governments have some influence in one way or the other in the way these state-owned electricity providers are run. For a country such as Zimbabwe, the power generation crisis obviously cannot be separated from the political turmoil that led it to be regarded as a failed state, characterised by maladministration, corruption, civil unrest, and poor governance structures across all sectors (Bhebe, 2013). According to Kaseke and Hosking, (2011) several electricity power projects which Zimbabwe has just commissioned, that includes the massive Batoka power plant, leaves everyone in doubt on whether the project will succeed or not since the country has been in budgetary distress over the years. And yet the point is, “organisational politics” has become worse and rife, continuously eroding the potential of the power utility to focus on its core business of generating the much-needed power for the economy.

The prevalence of organisational politics in organisations at the state-owned electricity provider is an unavoidable development for the simple reason that, organisations are by nature political arenas where battles are fought, won, or lost (Gotsis & Kortezi, 2011). The political activity becomes even more concentrated in state-owned electricity providers due to government influence as the entities are state controlled. In the process of such political battles, the functioning of the organisation is either positively or negatively affected. Whenever people gather to accomplish a common purpose, there is bound to be organisational politics, concurs Veluri (2019). It is therefore critical for managers to establish the nature and extent of organisational politics to fully understand the political environment in which they operate. Understanding the nature and extent of the political environment at the early stages equips managers with the right tools to handle the political pressure whenever it works against the normal organisational managerial practices. This article is triggered by the current situation in most of the Southern African national electricity providers which have had a fair share of organisational politics related challenges over the past two decades, exacerbated by the inability to generate adequate electrical power for the respective economies on the part of the national utility provider. The increasing levels of organisational politics at most of the national electricity providers in SADC are therefore cause for concern, culminating into power politics, fighting for positions, the struggle for resources and promotion, backstabbing, image tarnishing, blaming others, suspension from employment, unlawful termination of employment contracts as well as whistle blowing just to mention a few. In most instances, there are numerous media reports of tensions amongst employees within the national electricity providers where most of the politicking identified previously is prevalent. Failure to handle such challenges on the part of management often degenerates into heated debates that tend to affect the smooth flow of operations as evidenced by the resignation of South Africa’s Chief Executive Officer (CEO) of the national electricity provider (Eskom) following an altercation with the chairman of the Board (Kaseke & Hosking, 2011). News of the CEO’s resignation sparked the whole country, raising doubts about the power utility ability to handle organisational politics related challenges while at the same time forging ahead in generating the much-needed electrical power for Africa’s biggest economy.

Coming to Zimbabwe, the power utility generates only 1,300 MW of electricity against a daily consumption of 2,200 megawatts, falling short by 900 megawatts. To cover the gap the country has been importing power from neighboring countries but most of these countries have since cut off supply due to non-payment (Kawadza, 2013). According to Kakoma, Chilala, and Mwanza (2021), the national electricity provider of Zimbabwe is owed US 550 million by customers of which huge sums are owed by some high-profile government ministers making the debt recovery process more difficult as the ministers often use government political power to stop possible disconnections of power. The electricity situation in Zimbabwe has therefore reached alarming levels that are unimaginable. For example, the shortages have forced the national electricity provider to ration supplies to both domestic and commercial users with most areas going for 10 hours per day without electrical power (Kakoma, Chilala, and Mwanza, 2021). Load shedding has dented the once strong and vibrant economy of Southern Africa due to the electrical power generation crises (Kaseke & Hosking, 2011). This has hampered the provision of critical services such as conducting medical surgeries/operation. Many lives have been lost as medical doctors find it impossible to conduct medical operations using diesel electrical generators to power their operating equipment (Kaseke & Hosking, 2011). The national electricity supply has been struggling to power the economy for close to two decades without any sign of improvement and there is no hope of improvement in the near future as echoed by Zimbabwe’s Minister of Energy, Mangoma, as he lamented that load shedding was bound to worsen in 2012 and beyond,

citing the awarding of hefty allowances and salaries to senior employees as a grave organisational political mistake for an already resource stricken company (Karekezi, and Kimani, 2012). To add salt to an injury, negative organisational politics have become rife. Boardroom squabbles have become the order of the day and unbearable. The political battles between the board of directors and the general manager of the biggest power station have been predicted as influencing unproductive tendencies at the national electricity provider (Kakoma et al., 2021). For example, the boardroom squabbles resulted in the general manager's suspension instead of politically engaging to breed a more productive organisation, a more ignited environment that fosters growth and productivity. Gotsis and Kortezi, (2011) argue that organisational politics motivates the workforce in redefining the patterns of activity for organisational benefit. In support of this view, Butcher, and Clarke (2018) posit that organisational politics influences employee motivation that results in the overall improvement of organisational productivity. The presence of organisational politics voluntarily compels the role-players to work together in a politicised environment for a better future. In line with this school of thought, managers, employees, government, and the national electricity provider can take advantage of the politicised work environment to ignite a productive atmosphere. The article, therefore, seeks to identify and measure employee perceptions of organisational politics at the national electricity provider with an aim of harnessing dysfunctional politics towards a productive organisation.

The argument is, if the valuable time and effort spent on resolving matters related to power politics, resource distribution, promotions, backstabbing, favouritism, unnecessary termination of employment and suspension from employment pending investigations, is directed towards finding new ways of improving the power generation capacity, probably, Southern African national electricity providers would not be in such a critical power generation crisis. There could be other causative factors to the power generation crisis such as under capitalisation due to poor planning, lack of organisational and leadership skills, shortage of specific trade skills such as engineers and fitters, and inadequate resources. Van Niekerk (2013), on the same note, argues that undercapitalisation due to poor planning and lack of organisational skills may have far reaching effects regarding the performance of national electricity providers across SADC. However, following the increasing publicity of organisational politics in national and private media ahead of the other factors leaves organisational politics as prime suspect to the current electrical power generation crisis that is affecting most Southern African states (Engineeringnews, 2009).

Section 1 of this paper is followed by Section 2 which reviews the relevant literature. Section 3 presents the methodology used to collect and analyse data, study. Section 4 discusses and interprets the study results while section 5 provides the conclusion and recommendations of the study, limitations of the study as well as the scope for further research.

Literature review

Perceptions of organisational politics

The image of any organisation is purely a matter of perception of what goes around within an organisation and its surroundings, and it heavily impacts or influences on the day-to-day activities within the organisation. Of particular concern is the perception of organisational politics at a national electricity provider in the SADC country which happens to be Zimbabwe. For a country such as Zimbabwe it has become too obvious and common that the perceived view of organisational politics in most organisations be they private or public would be largely influenced by the economic, political, and social challenges the country would be facing. This is because organisations are managed by people who are affected by the political, economic, and social forces of the country in which they reside. Such is the perceived view of Zimbabwean companies. Drawing from the negative political developments that have bedeviled the country, one would expect the political tempo at the national electricity provider to be influenced by the developments in government since the national electricity provider is state-owned and controlled. Therefore, the organisational politics at the national electricity provider will have an element of government involvement.

Robbins et al. (2019) define organisational politics as activities that are not required as one's formal role in the organisation but that influence, or attempt to influence, the distribution of advantages and disadvantages within the organisation. Robbins et al. (2019) analyse the definition as encompassing key elements of what most people mean when they talk about organisational politics. Thus, political behaviour is outside one's specified job requirements. In recent decades, organisational politics (OP) has become a

growing field of interest in management studies. To date, the major scholarly effort has been dedicated to the exploration of the external organisational environment by customers, clients, and as far as governmental agencies such as the national electricity providers is concerned, by the public as well. However, one of the important aspects of this phenomenon which has received little attention over the years is the extent at which the key internal clients in an organisational setting such as managers and employees perceive organisational politics.

To better understand organisational politics, it is necessary to clearly explain what an organisation is and how organisational politics creeps in the contemporary organisation's management circles and practices. According to Karatepe (2013), an organisation is a group of individuals, who come together to realise their goals. Veluri (2019) sees an organisation as representing a social unit deliberately constructed and reconstructed to seek specific goals. It is important to note that human beings are born in organisations, educated by organisations and to acknowledge that they do spend most of their lives working in organisations. Even the families, in which they spent most of their time in, are also an organisation. Hence an organisation is a group of individuals who agree to share their effort in the realisation of common goals. The goals of an organisation are therefore derived from individual goals. Individuals, to realise their goals, must join an organisation of their choice. Aryee and Budhwar (2009) view an organisation as a social marketplace where individuals engage in transactions to obtain favourable dealings. An organisation is not merely a rational model of economic activities but is also a place where political activity and conflict takes place (Horton, 2010). The constraints of bounded rationality and imperfect information limit the ability of organisations to develop a complete set of rules and procedures to guide and govern employee and management actions and behaviour within an organisation setting.

Ferris, and Treadway (2012) define organisational politics as activities carried out by people to acquire, enhance, and use power and other resources to obtain their desired outcomes. Robbins et al. (2019) concur with the above sentiments when they say that whenever people get together in groups, power will be exerted. He emphasises that people want to carve out a niche from which to exert influence, to earn rewards, and to advance their careers, and when employees in the organisation convert their power into action, they are then described as being engaged in politics. Organisational politics, therefore, refers to those activities that are not required as one's formal role in the organisation, but that influence, or attempt to influence, the distribution of advantages and disadvantages within the organisation.

From the above assertions, organisations are deliberately created and maintained by people who have different goals and ambitions. The inherent selfish nature of human beings makes them compete to realise their individual goals, thus overlooking or even undermining the goals of others. To overcome this, organisations develop common goals that reflect the individual interests of its members. Despite the development of such common goals, some members will always try to meet their selfish ends, thus, individuals often find themselves having to rely on informal and unsanctioned means in making decisions, marking the beginnings/foundations of organisational politics. It is therefore clear that both informal and unsanctioned means of decision-making within the organisation, presents perpetrators of organisational politics with the opportunity to engage in political behaviour.

The high-level political tempo in organisations is manifested by the differences in the positions held by the employees. Differences in positions between managers and employees obviously compound the perceived view of organisational politics. Those placed in management positions always strive to take advantage of the power vested in them in making decisions in their favour, with employees on the receiving end. The concept of organisational politics is therefore closely related to power in an organisational setting; thus, political behaviour is the general means by which people attempt to obtain and use power. Put simply, the goal of such behaviour is to get one's own way about things.

The effects of organisational politics

According to Venugopal (2013), organisational politics does have positive and negative effects to the organisations. Robbins et al. (2019) argue that organisational politics can become too much to handle, leading to high turnover, decreased job satisfaction, decreased production levels, increased anxiety, stress, and reduced performance. In a study conducted by Smith (2017) on the effects of organisational politics on the manager's work, the findings were that many participants admitted that they found politics stressful and that they experienced the negative effects of such behaviour. In some cases, organisational politics had led

people to leave corporate life; that is “resigning”. The study highlighted that increased political behaviour undermines trust between people at all levels in organisations, a mistrust caused by people creating their own hidden agendas and being encouraged to compete with one another rather than work collaboratively. The study further revealed that the effects of political behaviour manifest in organisations, with around 1 in 2 managers reporting political behaviour as a key cause of conflict in their organisation (44%) and the most significant stressor in their working life (53%) (Smith, 2017). The major findings of the study were that political behaviour such as a lack of transparent decision-making and hidden agendas remains some of the biggest issues affecting trust at work (Venugopal, 2013).

The negative side of organisational politics is the fight factor where employees respond by fighting when faced with a threatening experience. Fighting does not resolve conflict but rather heighten the negativity and animosity. The angrier organisations’ members become, the further they get away from the solution to their conflicts. The ugly side of organisational politics indulges in distrust, dishonesty, and a counterproductive work environment. By allowing aggression, negativity, and the fight factor into organisational politics, tips the scale on fairness and welcomes everything that works against finding a meeting ground to naturally occurring disagreements. Jarret (2017) argue that organisational politics is more of a problem than the benefits. The major concern is that organisational politics consumes time and disrupts work activities. It is part and parcel of the process of loss that occurs in team discussions and work dynamics. Cacciattolo (2015) concurs with the view that organisational politics can be a nasty event where people promote their own self-interests at the expense of company goals. Organisational politics can also be secretive and can cause others to doubt the intentions of other people. Self-serving political actions can negatively influence social groupings; cooperation; information sharing; and many other organisational functions.

Cacciattolo, (2015) lament that many political tasks reduce trust and motivation to collaborate. When people operate in a tense political environment, they have difficulty relating to other employees. This ultimately undermines the conditions for active knowledge sharing. Robbins et al. (2019) present organisational politics as a threat to employees with decreased job satisfaction; increased anxiety and stress; increased turnover; and reduced performance. Robbins and co-authors assert that several interesting qualifiers have been noted. First the politics – gap performance relationship appears to be moderated by an individual’s understanding of the “how’s” and “why’s” of organisational politics. Studies by McShane and Glinnow (2011) reveal that employees who experience more organisational politics report higher stress, psychological withdrawal, and turnover. However, people tend to feel less stress and dissatisfaction as they experience the political tactics.

Explained in another way, lower performing employees tended to report different ranking patterns from their supervisors, and they also were more aware of the organisational politics in their companies. Interestingly, it did not matter which values came in the first place or last place. It only mattered that the patterns of rankings matched the supervisors’ patterns. The findings of the study were enlightening. The agreement in values leads to an improved employee-supervisor relationship with all the good things that such a relationship involves. Value agreement enhances communication and cooperation. Employees would experience these supervisors as invigorating, and the work they did together as important to their supervisors. The lesson drawn from the findings revealed a new way to protect employees from the negative effects of organisational politics and to help employees improve their performance. It all depends upon supervisors molding employee values to match their own.

According to Robbins et al. (2019), an individual who has a clear understanding of who is responsible for making decisions and why they were selected to be the decision-makers would have a better understanding of how and why things happen the way they do than someone who does not understand the decision-making process in the organisation. Accordingly, when both politics and performance are high, performance is likely to increase because the individual regards political action as an opportunity. On the contrary, when understanding is low, individuals are more likely to see organisational politics as a threat, which would have negative effects on performance. Secondly, when organisational politics is seen as a threat and consistently responded to with defensiveness, negative outcomes are almost sure to surface eventually. When people perceive politics as a threat rather than an opportunity, they often respond with defensive behaviours which are reactive and protective behaviours to avoid action, blame or change, a development which was prevalent at the national electricity provider between the board chairman and the CEO where the

two were blaming each another for the power utility's failure to implement an effective turnaround strategy.

According to Abun, Magallanes, Foronda, Paynaen, Agoot, and Pre (2018), organisational politics is viewed negatively by various organisations, although it may not necessarily always be a negative influence. Because organisations are arenas in which people have competing interests, effective managers must reconcile competing interests. It is critical to note that organisational politics is central to managing and as people try to acquire power and expand their power base, they use various tactics and strategies. A political behaviour refers to actions that are not officially sanctioned by an organisation that are taken to influence others to meet one's personal goals. Sometimes personal goals are aligned to organisational goals, and they can be achieved through other people's interests. But other times, personal goals and interests of others collide, and individuals pursue politics at the expense of others' interests.

Politics is a controversial topic among managers. Some managers take a favourable view of political behaviour; others see it as detrimental to the organisation. Abun, Magallanes, Acidera, Encarnacion, and Domingcil (2021) argue that some workers who perceive their workplace as highly political find the use of political tactics more satisfying and report great job satisfaction when they engage in political behaviour. Abun et al., (2018) posit that organisational politics is not automatically good or bad. It can serve several important functions including overcoming personal inadequacies, coping with change, and substituting formal authority. Some people may therefore thrive in political environments, while others may find office politics more distasteful, damaging, and stressful. According to Zhou and Ferris (2015), a study of 60 executives who had extensive experience in employee evaluation indicated that political considerations were nearly always part of the political appraisal process.

Zhou and Ferris (2015), contend that, the effects of political behaviour in organisations can be quite negative when the political behaviour is strategically undertaken to maximize self-interest. If people within the organisation are competitively pursuing selfish ends, they are unlikely to be attentive to the concerns of others. Schermerhor et al. (2008:229) allude that organisational politics can help identify problems and move ambitious problem-solving managers into breach. It is quicker than restructuring. Organisational politics allows the organisation to meet unanticipated problems with people and sources quickly before small headaches become major problems.

The workplace can seem less helpful, more threatening, and more unpredictable. People focus on their concerns rather than on organisational goals. This represents the negative face of organisational politics. If employees view the organisation's political climate as extreme, they experience more anxiety, tension, fatigue, and burnout negatively affecting performance. They ultimately become dissatisfied with their jobs and are likely to leave the organisation. Although positive political behaviour still involves self-interest, when it is aligned with organisational goals, the self-interest is perceived positively by employees. Political behaviour is also perceived positively when it is seen as the only means by which to accomplish something. According to Kreitner, and Kinicki, (2012), organisational politics can facilitate adaption to changes in the environment and technology of the organisation. In view of developments at the national electricity provider, this could be a positive factor of organisational politics, where employees and management are made to think outside the box because of the pressure from the prevailing political environment.

Organisational politics is endemic to organisations. People come to work situations with many goals, not just one unified goal. These goals invoke conflict and competition among workers for the expenditure of scarce resources. According to Landells, and Albrecht (2019), organisational politics involves amassing organisational power for personal benefits, rather than organisational objectives. It is prevalent in most of the organisations and can adversely affect organisational productivity. According to George and Jones (2009), organisational politics can be dysfunctional to the organisation leading to high levels of labour turnover, yet when organisational interests integrate with employee interests and when it is used for the benefit of the organisation then it can be functional and advantageous for the organisation.

Managerial practices to minimise negative politics

Managerial practices for reducing negative politics in organisations depict management efforts to successfully deal with negative politics in an organisation. There are various practices which managers can engage in to curb negative politics. Kawasaki, Inui, and Miyagawa (2022). argue that managing negative politics does not happen by chance. Managers must make deliberate efforts that can unblock barriers to change, produce greater organisational cohesion and create greater buy-in to key projects.

Managerial communication

Whenever there is ambiguity or change that is not clearly understood or accepted by the organisation's workforce, management must step in quickly and communicate effectively to clear the air. Subramanian (2016) argues that communication both formal and informal is like blood to any organisation that serves as a medium to distribute important information amongst the organisation's workforce thereby promoting a conducive political environment. Effective communication can simplify successful organisation operation (Ince et al., 2011:107). It also helps in promoting self-awareness; aptitude; the right attitude; technical competence to deliver results awareness of the organisation and political landscape; personal authenticity; honesty; integrity; relationship-building skills to create win-win outcomes; sound analytical skills; and an ability to interpret the formal, informal, internal, and external power-plays (Tan, 2009). In the overall, managers need to improve their organisational communication strategies to ensure that every employee is aware of what is happening. Ince et al. (2011:107), assert that organisational communication is intertwined in politics of the organisation and promotes the exchange of knowledge and opinions. Ince and Gul (2011) underscores organisational communication as a management responsibility largely responsible for creating a positive atmosphere for all employees. Barter et al. (2010:213) provides both vertical and horizontal communication as potential tools for an effective manager in masterminding the negative tendencies of organisational politics, with vertical communication defining the organisation and what it stands for, while horizontal communication addresses task related issues on the entire workforce.

Managerial support

Fedor, Maslyn, Farmer, and Bettenhausen, (2018). argue that manager support exists when employees perceive their immediate manager as leading by example, giving them the support needed to do the job well. In support of this, Eldor, (2016). concluded that since immediate managers are perceived as agents of the organisation, their behaviours play critical roles in shaping the employees' attitudes and behaviours and their level of commitment to the organisation. The unique contribution of perceived manager support by employees plays a major role in building a working relationship that defeats the breeding of negative politics. It is clear from the foregoing that managerial support is a handy tool that can successfully harness negative politics. Byrne, Manning, Weston, and Hochwarter, (2017) argue that a high-quality relationship between a manager and employee breeds a positive psychological empowerment that gives no room to negative political tendencies in an organisation.

Managerial interaction

Bender, Bloom, Card, Van Reenen, and Wolter, (2018) argue that an ideal managerial interaction revolves around ways of being noticed and having ideas accepted without harming relationships. Managers must build relationships; put ideas forward to thwart negative politics. Managers need to understand the internal working environment within organisations and use principled tactics to achieve career success. To get started, managers need to identify what they would like to achieve and orient their actions toward those goals. Tan (2009) provides the following as managerial practices to minimise negative politics: Networking and building trust through strategic alliances; upholding fairness, nurturing reliable, dependable, mutually beneficial working relationships with individuals or groups within and outside the organisation through both formal and informal channels, and working with individuals aligned to the same set of principles and values, and focused on delivering results based on merit and performance. It also includes consulting key stakeholders prior to decision-making, fostering accountability and responsibility, encouraging a 'win-win' and belief in teamwork; and maximising and optimising resource distribution.

Managerial effectiveness

While managerial interaction as cited Bloom, and Van Reenen, (2017), is instrumental in harnessing organisational politics, managerial effectiveness provides a supportive role by promoting a sound political environment. Managerial efficiency has a very old history that dates to the 1970s. Ferris, and Treadway (2012) define managerial effectiveness as the degree to which managers achieve the output requirement of his/her job with and through other employees. The effectiveness of a manager is by and large political in nature for the simple reason that each employee plays a role that accounts for the manager's effectiveness. Landells and Albrecht (2019) argue that the effectiveness of the manager must be measured in terms of the

output. In line with this reasoning the effectiveness of the senior managers at the national electricity provider must be measured in terms of the generation of electrical power. According to Vigoda-Gadot, Vinarski-Peretz, and Ben-Zion (2013), managerial practices for fostering effectiveness in a negatively politicised work environment would include recognising what needs to be done, engaging all employees and other stakeholders, consulting internal and/or external experts on critical matters, understanding the nature of the organization, and developing action plans. In addition, the practices include taking responsibility for decision-making, taking responsibility for communication, focusing on opportunities rather than problems; and running productive meetings.

Ferris, and Treadway, (2012) postulate that effective managers need to be politically sensitive to deal with demands, constraints, and choices during their daily management practices. An organisation is driven by the demand for the product or service. Managers are unfortunately limited by the constraints; as such they need to make intelligent choices to take the firm to the next level. Managers at the national electricity provider are often confronted with the demand for electrical power that has become a proverbial challenge for the country. Demand is a potential factor for negative politicking if unresolved. Miller, Rutherford, and Kolodinsky, (2018), asserts that demands are tasks that the manager must deal with, and he/she can choose to ignore or delegate. Managers at the national electricity provider must also deal with the constraints. Constraints are the factors that limit the manager's actions which include the lack of resources, and people's attitudes. Managers at the national electricity provider must make choices that benefit the generality of the people and the stakeholders. Analoui (2010) posits that choices represent the opportunities which exist in the job that enable the manager to act differently from what other managers are doing.

According to Karatepe, (2013), managerial effectiveness in the public sector organisation in Ghana, made significant contributions to the study on managerial effectiveness by identifying the managerial parameters as key to the manager's effectiveness, and these include perception of own effectiveness, managerial skill or lack of it, organisational criteria for effectiveness, and motivation of senior manager's effectiveness. They also include the degree of demands and constraints, the presence of choice and opportunities and nature of inter and intra organisation relationships. The points raised above are deeply immersed in the organisation's political life. The national electricity managers could benefit from such managerial practices by making an introspection of themselves and begin to weigh their effectiveness, skill relevancy, criteria of work effectiveness, motivation, by conducting a SWOT analysis of the organisation as well as assessing their internal and external relationships.

Managerial participation/involvement

Managers have several ways of reducing negative organisational politics. Morehead and Griffin (2009) provide the techniques for managerial participation/involvement to reduce negative political behaviour as controlling of information, holding of meetings with employees, controlling the agenda, upholding transparency, facilitating equitable distribution of resources, and building of coalitions.

Research methodology

The study employed a quantitative research design, gathering data from a target population of 2210 employees. A sample of 1400 participants was randomly selected, representing 63.35% of the population. From the 1400, only 358 completed questionnaires were returned by the cut-off date. Of the 358, 11 were discarded as they were incorrectly completed, giving an effective response rate of 24.78%. Data was analysed using the statistical software programme SPSS 21.0. To develop the conceptual model, the study performed factor analysis on the perceptions, effects of organisational politics, and managerial practices to minimise organisational politics. Before factor analysis could be performed, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, exploratory factor analysis, Bartlett's test of sphericity; and Cronbach Alpha's reliability coefficient were performed, and thereafter Cronbach's alpha was ascertained to determine the internal consistency.

Discussion and interpretation of results

Exploratory factor analysis was used as a tool to measure constructs on perceptions of organisational politics, effects of organisational politics, and on managerial practices to minimise negative effects of organisational politics. The primary objective was to identify underlying constructs in the data set. In pursuit

of this objective, “exploratory factor analysis” was conducted on all the these constructs. However, before factor analysis could be successfully performed, the data were subjected to the Kaiser-Meyer-Olkin (KMO), measure of sampling adequacy and Bartlett’s test of sphericity to ensure that the sample of the article was adequate, and that the data is suitable for factor analysis (Field, 2018). KMO values of at least 0.6 should be present for factor analysis to be considered, although values between 0.5 and 0.7 are too low (Du Plessis, 2009). According to Fields (2018), values between 0.7 and 0.8 are regarded as good while values between 0.8 and 0.9 are excellent. Values between 0.9 and 1 are superb. Bartlett’s test of sphericity is used to test the null hypothesis that the variables in the population correlation matrix are uncorrelated. (Coakes & Steed, cited by Bisschoff et al., 2012). The acceptable significance level is equal or below .005 (Fields, 2018). If the value is below 0.005, the data is suitable to proceed with factor analysis (Du Plessis, 2009:58). The Cronbach alpha was also calculated to determine the reliability and the internal consistency of the data (Wuensch, 2009:58).

Perceptions of organisational politics

Under this section, the study discusses the results aligned to the perceptions of organisational politics to identify the critical factors to develop a conceptual framework to manage organisational politics.

KMO and Bartlett’s Test

The adequacy of the sample and the suitability of employing factor analysis on perceptions of organisational politics were determined by the KMO measure of sampling adequacy and the Bartlett test of sphericity. The KMO measure of sampling adequacy was performed to ensure that the sample employed was adequate. Table 1 presents the results:

Table 1: The Kmo And Bartlett’s Test

KMO and Bartlett’s Test	
KMO Measure of SamplingAdequacy	.906
Bartlett’s Test of Approx. Chi-SquareSphericity	6513.680
df	253
Sig	0.000

The KMO value for perceptions of organisational politics was 0.906. This signifies that, statistically, the sample was adequate. The high KMO value more than 0.90 signifies an excellent sample. Regarding the Bartlett’s test of sphericity, the value was below 0.005. This means that the strength of the relationship among variables was not strong. Resultantly, this measure showed that factor analysis was a suitable statistical technique to analyse the data to determine the factors on perceptions of organisational politics.

Exploratory factor analysis

The exploratory factor analysis identified four factors by means of Varimax rotation. According to Field (2018), Varimax is a method of orthogonal rotation that attempts to maximise the dispersion of factor loadings by loading a smaller number of variables highly onto each factor resulting in a more interpretable cluster of factors. Factor loadings equal and above 0.40 are significant and used in the analysis (Statistica, 2022). Table 2 below shows that all 23 statements loaded onto four factors. The factor loadings are shown in the table 2 below. The four factors explain a very favourable cumulative variance of 74.28%.

Table. 2 Factor loadings on perceptions of organisational politics

STATEMENTS	NO	FACTORS			
		1	2	3	4
It is common to push the blame on others	10	.891			
Infighting is prevalent among employees	13	.875			
Criticisms among peers is common	11	.859			
Hiding of important information is common	9	.794			

Favouritism is common	8	.765			
Peers support each other	12	.643			
The central government controls the department	7	.638			
Managers make decisions that derail the organisation	6	.565			
The department is regulated by rules	24		.903		
The department is regulated by policies	25		.888		
The department does have clear objectives	22		.882		
Employees are not sure on how to achieve targets	21		.838		
Employees feel that they can accomplish personal goals	18		.755		
Employees are not sure whether their employment contracts can be renewed	19		.722		
Decisions are made through consultations	16		.646		
Backstabbing is common in this department	2			.864	
Gossiping is a common phenomenon in	3			.849	
Employees' views are upheld	1			.823	
The department relies on informal communication for advertising new jobs	4			.748	
The department relies on informal communication when inviting employees to staff meetings	5			.560	
Promotions are based on favouritism	17			.708	
Managers' decisions are upheld	23			.599	
Employees are not sure of what their targets are	20			.539	
% of variance explained		42.42%	16.59%	9.01%	6.24%
Cumulative %		42.42%	59.01%	68.04%	74.28%

Source: Own compilation

Factor 1: Managerial behaviour

A total of eight statements, namely 10, 13, 11, 9, 8, 12, 7 and 6 loaded on factor 1. All the statements under factor 1 relate to the way managers deal with organisational politics at the State-owned electricity provider. The factor is thus labelled as managerial behaviour. Statement 10, 13 and 11 are above 0.80 which suggests that respondents are dissatisfied with the way managers perceive organisational politics. The factor explains a variance of 42.42%. Managers are expected to behave in a manner that successfully reduces dysfunctional politics. Contrary to this, the finding suggests that managers at the national electricity are part of the problem as they contribute to a dysfunctional work environment. For example, they engage in negative criticism, blame their peers, favour other employees, and make disastrous decisions. Managerial behaviour plays a major role in an organisation which is predominantly politicised. According to George and Konstantinos (2011), managers negatively contribute to negative politics by withholding support for employees in a politicised environment. Thus, George and Konstantinos (2011), argue that the support given by a manager to an employee is a determinant factor to organisational success. It is clear from the study that respondents (employees) are not happy with managerial behaviour when dealing with political challenges that they encounter. Jennifer et al. (2012) argue that managerial support to the employee is of critical importance as it provides emotional or instrumental resources. To the national electricity provider, such behaviour on the part of a manager would be unproductive as it affects the morale of the employees. Cohen et al., (2000), are of a similar view when they assert that, unsupportive managerial behaviour is detrimental to the employee's motivation. Hence, managerial behaviour has a negative effect of reducing productivity at the national electricity provider.

Factor 2: Poor communication of objectives

Statements 24, 25, 22, 21, 18, 19 and 16 are all loaded on factor 2 and are related to poor communication of objectives within the national electricity provider. The factor is thus labelled as poor communication of objectives. Seven factor loadings out of eight are above 0.75 which shows a good fit to the factor. It, however, gives support that communication of objectives at the national electricity provider is problematic. For a massive organisation such as the national electricity provider, effective communication is a basic requirement. Without effective communication, the organisation is destined to collapse. The rules, regulations and policies serve as the communication tool for the national electricity provider. Unfortunately, respondents are not happy with the overall communication of objectives. The factor explains a variance of 16.59%. Literature reviewed underscores the importance of communication of organisational objectives as a pillar of strength underpinning the success of the organisation. Ince and Gul (2011) posit that organisations that fail to effectively communicate objectives to its internal stakeholders such as the employees, is unlikely to meet its targets. The national electricity provider has fallen prey to this as respondents have decried that objectives are not effectively communicated.

Factor 3: Unexpected employee behaviour

Five statements namely: 2, 3, 1, 4, and 5 all loaded on factor three with statements 2, 3 and 1 reflecting factor loadings above 0.80. Statement 4 had a factor loading of 0.748 while statement 5 had one of 0.539. All the statements loading onto this factor deal with unexpected employee behaviour, suggesting that employee behaviour at the national electricity provider is problematic. This suggests that employees at the national electricity provider engage in dysfunctional politics. The factor explains a variance of 9.01%. Judy et al. (2007), identifies a lack of trust by employees towards their managers as a recipe for unexpected employee behaviour leading to gossiping and backstabbing as examples, thereby negatively affecting performance effectiveness and the general healthy flow of work processes.

Factor 4: Unhealthy managerial practices

Only three statements namely 17, 23, and 20 loaded on factor 4. All the statements relate to unhealthy managerial practices at the national electricity provider. The factor loadings confirm that an unhealthy managerial practice presents problems for the organisation, in particular engaging in favouritism, poor decision-making as well as setting unrealistic targets for the employees. The factor explains a variance of 6.24%. Managers are at the fulcrum of the organisation; as such their practices must unite employees, support the organisational goals as opposed to engaging in favouritism and making decisions that derail the organisation. Managers must be good politicians, they should shun favouritism, gossiping and backstabbing just to name a few. Butcher and Clarke (2018) posit that managers who are good politicians must be able to read hidden agendas, work on the informal and formal decision-making processes and be able to decipher the sub-text of what is said and not said. Politics is so central to managerial work; therefore, skills to improve managerial practices should also be central to the development of managers (Clarke, 2018). Managers at the national electricity provider do engage in managerial practices that are counterproductive (unhealthy) as reflected by the findings.

Reliability of the factors

The reliability of the four factors is shown in Table 3 below. All the factors have returned reliability coefficients which is well above the required 0.7. These high alpha coefficients indicate that the four factors possess excellent reliability and internal consistency.

Table 3- Reliability statistics

Data Sets	Cronbach's Alpha
Factor 1	0.927
Factor 2	0.934
Factor 3	0.889
Factor 4	0.859

Effects of organisational politics

Under this section, the study discusses the results aligned to the effects of organisational politics to identify

the critical factors to develop a conceptual framework to manage organisational politics.

KMO and Bartlett's test

The Bartlett test of sphericity and the KMO measure of sampling adequacy on the effects of organisational politics was performed, and the results are shown in table 4. below.

Table 4. The KMO and Bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.919
Bartlett's Test of Sphericity	Approx. Chi-Square	6366.838
	Df	210
	Sig.	0.000

The KMO measure on effects of organisational politics returned an excellent value of 0.919, indicating that the sample was highly adequate. In addition, table 4. shows that the Bartlett's test of sphericity also returned favourable value less than the required value of 0.005 meaning that there was no or little relationship between the variables, and that the data was suitable to be subjected to exploratory factor analysis (Field, 2018).

Exploratory factor analysis

The exploratory on the effects of organisational politics factor analysis identified three factors by means of an orthogonal normalised Varimax rotation. According to Field (2018), Varimax as method attempts to maximise the dispersion of factor loadings by loading a smaller number of variables highly onto each factor. This typically results in more interpretable factors which explain more of the variance. Factor loadings of 0.40 and above are significant and are used in the analysis (Statistica, 2022). The factors and the criteria loading onto them are presented in table 4 below. The Table indicates that 21 of the 22 statements loaded onto three factors. Resultantly, only one statement was discarded since it did not load onto a specific factor with a factor loading of 0.40 or higher. The factor loadings are shown below. Noteworthy is the high cumulative variance explained by the three factors (74.65%).

Table 5 Factor loadings on effects of organisational politics

STATEMENTS	NO	FACTORS		
		4	5	6
The department promotes networking	32	.903		
The department plays an important role in promoting growth	31	.863		
The department promotes teamwork	33	.862		
The department makes an effort to solve its problems	30	.855		
The department has clear goals	34	.838		
The department identifies its problems	29	.835		
Infighting amongst employees promotes cohesion	35	.784		
The department is productive	27	.711		
The department promotes change	28	.634		

Employees in the department are satisfied with their jobs	37	.530		
Infighting leads to internal conflict	46		-.904	
Infighting is a source of problems	43		-.804	
Infighting leads to reduced job performance	42		-.820	
Workers in this department are unproductive	45		-.819	
Infighting undermines trust among employees	47		-.817	
Important information is kept a secret	44		-.797	
Infighting among employees destroys teamwork	40		-.675	
Infighting among employees is time wasting	38			.887
Infighting among employees disrupt work activities	39			.883
Infighting among employees increases stress levels	41			.875
The department has high labour turnover	36			.721
% of variance explained		48.41%	14.78%	11.46%
Cumulative %		48.41%	63.19%	74.65%

Source: own compilations

Factor 5: Positive departmental actions

A total of ten statements, namely statements number 32, 31, 33, 30, 34, 29, 35, 27, 28, and 37 loaded on factor 1. All the statements under factor 1 deal with positive actions undertaken by the national electricity provider to reduce organisational politics and ensure a productive work environment. The factor is thus labelled as Positive organisational actions. Statements 32, 31, 33, 30, 34 and 29 all have factor loadings more than 0.80, suggesting that these statements are regarded as very significant by the respondents at the national electricity provider. The first factor explains a favourable variance of 48.41%. This finding is supported by Robbins et al. (2019) when they argue that organisational politics motivates the workforce in redefining the patterns of activity for organisational benefit. In support of this view Clarke et al. (2018) posit that organisational politics influences employee motivation resulting in overall improvement of organisational productivity. In support of this finding Smith (2017), highlighted that organisational politics can facilitate adaption to changes in the environment and technology of the organisation. In view of developments at the national electricity provider, this could be a positive factor of organisational politics, where employees and management are made to think outside the box because of the pressure from the prevailing political environment.

Factor 6: Negative employee actions

Statements 46, 43, 42, 45, 47, 44 and 40 all loaded on factor 2. Only statements 40 and 44 have factor loadings below an absolute value of 0.80, but well more than the cut-off absolute factor loading of 0.40. All the statements relate to negative actions that employees can participate in and create a politicized work environment. Because the factor identifies negative employee (individual) actions, the factor is labelled as such. The factor explains a variance of 14.78%. It should be noticed that the factor loadings on all the statements of this factor are all negative. This means that although the respondents recognize that negative employee behaviour exists, this behaviour is not present at the national electricity provider, and employees do not enter such unproductive and devious behaviour. Tan (2009) gives support of the finding by arguing that organisational politics negatively affect employee morale ultimately reducing productivity levels. According to Tan (2009), organisational politics drains employees' energy; wastes the organisation's resources; causes merit to go unrewarded; results in loss of valuable talent; and in the worst-case scenario drives away business opportunities. Venugopal (2012) echo similar sentiments by stating that employees who experience more organisational politics report higher stress, psychological withdrawal and turnover. Robbins et al. (2019) vindicate the above by singling organisational politics as a threat to employees with decreased job satisfaction; increased anxiety and stress; increased turnover; and reduced performance.

Obviously, the prevalence of organisational politics was so intense at the electricity provider to the extent of negatively impacting on key stakeholders, “employees”. Jarret (2017), contend that though organisational politics can be viewed negatively by various organisations; “it is not necessarily negative”. Cacciottolo (2015) agree that organisational politics is not automatically good or bad. It can serve several important functions within the organisation including overcoming personal inadequacies, coping with change, and substituting formal authority. Therefore, the national electricity provider has a lesson to learn, by taking advantage of the politics as providing some checks and balances to improve the organisation.

Factor 7: Personal consequences

Four statements, namely: 38, 39, 41 and 36 loaded on factor 3. These statements disrupt work, waste time, increase stress levels and cause labour turnover. The factor is thus labelled as personal consequences because it shows the effect organisational politics have on a personal level on the employee. Statements 38, 39 and 41 all reflect factor loadings above 0.80 suggesting that the respondents regard them as very significant. The factor has a variance of 11.46%. The finding is backed by Robbins et al. (2019) as they argue that organisational politics can become too much to handle, leading to high labour turnover. Organisational politics can be very stressful to the extent of influencing resignations thereby negatively affecting the organisation’s capacity to productive performance (Gotsis & Kortezi, 2011). High labour turnover is an issue to companies as it undermines the production possibilities of a company. Abu et al., (2018) argue that organisational politics can be dysfunctional to the organisation to the extent of causing high labour turnover, yet when organisational interests integrate with employee interests and when it is used for the benefit of the organisation then it can be functional and advantageous for the organisation.

Reliability of the factors

Cronbach's alpha determines the internal consistency or average correlation of items in a survey instrument to gauge its reliability (Wuensch, 2009). For this research, the minimum coefficient is set at $\alpha \geq 0.70$ (Field, 2018). Table 4. below reflects the reliability coefficients for all three the factors. It is clear from the table that all the factors have a return of a very satisfactory reliability coefficient more than 0.90. This exceeds the required 0.7 by far and shows excellent reliability and internal consistency of data pertaining to each factor (Field, 2018).

Table 4 Reliability statistics

Data Sets	Cronbach's Alpha
Factor 1	0.950
Factor 2	0.927
Factor 3	0.913

Managerial practices to minimise negative organizational politics

Under this section, the study discusses the results aligned to managerial practices to minimise negative organisational politics towards the development of a conceptual framework to manage organisational politics.

KMO and Bartlett's test

The Bartlett test of sphericity and KMO measure of sampling adequacy managerial practices were performed, and as shown in figure 5. below:

Table 5: The KMO and Bartlett Test

Kaiser-Meyer-Oklin Measure of Sampling Adequacy				.943
Bartlett's	Test	of	Approx. Chi-SquareDf	4446.486
Sphericity			Sig.	120
				0.000

The KMO measure of 0.943 was excellent indicating that the sample was more than adequate. In

addition, the Bartlett's test of sphericity also returned a favourable value which was less than the required 0.05. This means that there were limited inter-correlations and that multicollinearity in the data was eliminated. As a result, the data was confidently subjected to multivariate statistical techniques such as exploratory factor analysis (Michigan University, 2013).

Exploratory factor analysis

The exploratory factor analysis on managerial practices to minimise negative organisational politics identified two factors by means of an Orthogonal Varimax rotation. According to Field (2018) Varimax as rotational method attempts to maximise the dispersion of factor loadings by loading a smaller number of variables highly onto each factor resulting in more interpretable factors. Only factor loadings of 0.40 and above are significant and used in the analysis (Statistica, 2006). Resultantly, only two statements (53 & 54) were discarded since they did not load onto a specific factor with a factor loading of 0.40 or higher. Table 5 below indicates that, in total, 16 of the 18 items loaded onto two factors. These two factors explain a very favourable cumulative variance of 70%.

Table 5. factor loadings: managerial practices to minimise negative politics.

STATEMENT	NO	FACTORS	
		7	8
To what extent does management utilise external experts in resolving infighting?	64	.939	
To what extent does management promote neutrality when resolving infighting amongst employees?	63	.933	
To what extent does management utilize internal experts in resolving infighting?	65	.932	
To what extent does management promote teamwork?	62	.843	
To what extent does management make compromising decisions when handling infighting?	61	.779	
To what extent does management avoid confrontation with employees?	58	.697	
To what extent does management promote unity among employees?	59	.645	
To what extent does management encourage compromise amongst infighting employees?	60	.623	
To what extent does management uphold fairness in handling infighting amongst employees?	57	.606	
To what extent does management promote open communication?	56	.602	
To what extent does management consult on key players in the political system?	55	.577	
To what extent does management promote the employment of cronies in the department?	50		.905
To what extent does management promote transparency in the department?	51		.796
To what extent does the department hold staff meetings?	52		.786
To what extent does management promote equitable distribution of resources?	48		.676
To what extent does management uphold fairness in the selection process?	49		.654
% of variance explained		60.70%	9.41%
Cumulative %		60.70%	70.12%

Source: own compilation

Factor 8: Managerial Fairness

A total of 11 statements, namely: 64, 63, 65, 62, 61, 58, 59, 60, 57, 56 and 55, loaded on factor 1. All these statements deal with managerial fairness; hence the factor is labelled as *Managerial fairness*. Statements 64, 63, 65, and 62 show very high factor loadings of 0.80 or higher. This suggests that these statements are regarded as very significant by the respondents in relation to the extent to which managers exercise fairness as they manoeuvre in a politicised work environment at the national electricity provider. The factor explains a high variance of 60.70%. Tan (2009) provides a myriad of managerial practices for minimising negative

politics of which upholding fairness on the part of management is considered one such political weapon to minimise negative politics. By upholding fairness, managers can win the hearts of the workforce resultantly cultivating a motivational spirit that leads to a productive organisation.

Factor 9: Managerial participation

Statements 50, 51, 52, 48 and 49 all loaded on factor 2 and are related to managerial participation. Thus, the factor is labelled as managerial participation. All the factors are above 0.60 giving support that managerial participation is problematic which could be a source of employee demotivation at the national electricity provider. The factor explains a variance of 9.41%. Landells, and Albrecht, (2016). provide the techniques for managerial participation to reduce negative political behaviour: as the ability to control information; hold staff meetings; controlling the agenda; promoting transparency; facilitating equitable distribution of resources; and building coalitions. Jones and George (2019:) support the need for managerial participation in harnessing negative politics. They argue that managers need to participate through controlling uncertainties, making themselves irreplaceable, building alliances strategically positioning themselves as well as generating resources for the organisation to effectively reduce negative politics. From the factor analysis, two factors were identified, namely *Managerial Fairness* and *Managerial Participation*. It is important to note that *Managerial Fairness* as first factor explains 60% of the variance while the *Managerial Participation* as the second factor explains a significantly less (yet acceptable) variance of 9%. This means that the first factor is much more important, and that management should focus their efforts on fairness rather than participation: first to instill positive organisational politics because it will yield much better returns on managerial energy spent. However, managerial participation was also identified as a factor, and should by no means be neglected by management.

Reliability

The reliability of the data and the extracted factors was determined by using the coefficient Cronbach's alpha. As is common in reliability analysis, the minimum coefficient is set at $\alpha \geq 0.70$ (Field, 2018; Du Plessis 2010). The table 6 below shows the reliability coefficients for the two factors extracted. Both factors have very satisfactory reliability coefficients which are more than 0.89 (one is marginally lower than 0.90, which is regarded to be superb, while the other factor exceeds the 0.90 margin with ease). This reliability coefficients show excellent reliability and internal consistency of data pertaining to each factor.

Table 6 reliability statistics

Data Sets	Cronbach's Alpha
Factor 1	0.941
Factor 2	0.891

Conclusions

This study investigated the pervasive nature of organisational politics within Zimbabwe's state-owned electricity provider and its impact on performance and organisational climate. Through a robust quantitative methodology and factor analysis, the research identified key drivers of organisational politics – namely, managerial behaviour, poor communication of objectives, unexpected employee behaviour, and unhealthy managerial practices. These internal factors, deeply intertwined with government influence in state-owned entities, were shown to contribute to inefficiencies and deteriorating employee morale.

The findings confirm that organisational politics has predominantly negative effects, including stress, reduced job satisfaction, poor collaboration, and low productivity. While some positive political actions were acknowledged (e.g., adaptability and motivation through structured political behaviour), these were overshadowed by the dysfunction caused by infighting, favouritism, secrecy, and a lack of transparent communication. The study underscores the urgent need for deliberate and structured managerial interventions aimed at cultivating fairness, transparency, and inclusive participation. A conceptual framework was developed, providing a diagnostic and prescriptive model for minimising political behaviour and enhancing organisational effectiveness in Zimbabwe's electricity sector, with possible replication across other SADC utilities.

Recommendations

Drawing from the various factors identified through factor analyses, the following conceptual model is proposed to manage organisational politics at SoEs as reflected on Figure 1.

Figure 1: Conceptual model to manage organisational politics at SoEs



Source: Own compilation

Notes on the Recommended Conceptual Framework

The conceptual framework developed through this study presents a comprehensive and diagnostic model for understanding and managing organisational politics within state-owned electricity providers, particularly in politically influenced environments such as Zimbabwe. Built on three interrelated dimensions—employee perceptions of politics, the effects of organisational politics, and managerial responses—the model offers both theoretical insight and practical utility.

Central to the model are the identified factors that drive political behaviour. These include managerial behaviour, poor communication of objectives, unhealthy managerial practices, and unexpected employee behaviour. These factors provide a foundational understanding of the sources of internal discord that destabilise organisational cohesion and effectiveness. Their presence signals a breakdown in formal processes, often exacerbated by opaque decision-making and government interference.

The framework also maps the consequences of organisational politics along three pathways: negative employee actions, personal consequences such as stress and turnover, and, to a limited extent, positive departmental actions. While organisational politics is often viewed in pejorative terms, the study recognises that when properly channelled, political behaviour can lead to constructive change, innovation, and increased adaptability.

Perhaps the most significant contribution of the model lies in its proposed managerial practices for minimising negative political behaviour. Two dominant themes emerged from the data: managerial fairness and managerial participation. Managerial fairness—characterised by neutrality, transparency, and equitable treatment—proved to be the more impactful strategy, explaining over 60% of the variance in factor analysis. This suggests that employee perceptions of fairness are crucial to mitigating toxic politics and fostering organisational trust.

Managerial participation, although less dominant, still plays a vital role. By engaging employees in decision-making processes, promoting transparency, and ensuring inclusive communication, managers can dilute the influence of informal political networks and re-establish legitimacy in leadership processes.

The model's strength lies in its adaptability. While developed within the context of Zimbabwe's electricity provider, its components are relevant to other state-owned entities across emerging markets facing similar challenges. By systematically addressing the root causes and consequences of organisational politics and outlining actionable managerial strategies, the framework offers a roadmap for restoring functionality,

morale, and performance in politically embattled institutions

Limitations of the study

While the study offers significant contributions to understanding organisational politics within state-owned electricity providers, it is essential to acknowledge and critically reflect on the limitations encountered. Importantly, steps were taken throughout the research process to minimise the potential negative impacts of these limitations on the validity and reliability of the findings.

A primary limitation lies in the **geographic and organisational scope** of the study, which focused solely on Zimbabwe's national electricity provider. While this context provides a rich case study for understanding political dynamics in a state-owned utility, it limits the generalisability of the results across other national utilities in the Southern African Development Community (SADC). However, this limitation was mitigated by grounding the study in extensive literature across the SADC region and including regional references in the conceptual discussion to establish a broader contextual relevance. The theoretical foundation and proposed model were thus designed with transferability in mind, offering a framework that can be tested in similar environments elsewhere in future studies.

Another concern was the **low response rate**, with only 347 valid responses out of 1,400 distributed questionnaires, resulting in a 24.78% effective response rate. This limitation was anticipated due to the politically sensitive nature of the topic. To mitigate non-responsiveness and potential bias, the study implemented multiple strategies: the questionnaire was kept concise and user-friendly, respondents were assured of anonymity and confidentiality, and the management hierarchy was engaged to encourage participation across departments. Furthermore, despite the relatively low response rate, the reliability of the data remained exceptionally strong. The internal consistency scores – Cronbach's Alpha values ranging from 0.859 to 0.950 – demonstrated excellent reliability, confirming that the responses collected were consistent and dependable for analysis.

Language barriers presented a third challenge, considering that English is a second language for many employees. Recognising this, the questionnaire was carefully crafted in plain, accessible language, with clearly phrased statements aimed at avoiding ambiguity. Pre-testing of the instrument among a small representative group helped refine the wording to ensure clarity and reduce misinterpretation. Additionally, because the majority of employees at the state-owned utility possess at least a secondary education and operate in English-speaking work environments, the likelihood of widespread misunderstanding was significantly minimised.

The **potential for social desirability bias** was another concern, particularly given the sensitive nature of organisational politics in a highly politicised state enterprise. While this cannot be entirely eliminated, efforts were made to reduce it. Questionnaires were administered anonymously, and respondents were explicitly informed that their participation would have no consequences and that no identifying information was required. Moreover, the research was introduced to participants as an academic exercise aimed at improving organisational functioning, rather than as a political audit, which helped lower defensiveness and enhance candour.

Finally, the **cross-sectional nature** of the study limited the ability to track the evolution of organisational politics or managerial interventions over time. Although longitudinal studies may offer richer insights into the progression of political dynamics, the current study mitigated this limitation by embedding a comprehensive historical and contextual analysis of Zimbabwe's electricity sector within the literature review. This contextual grounding offered a temporal dimension to complement the snapshot nature of the data, making the findings more robust and informative.

In conclusion, while the study faced the typical limitations inherent in organisational research within politicised environments, these were carefully anticipated and addressed. Methodological rigor, thoughtful instrument design, and analytical robustness ensured that the findings and the resulting conceptual framework are both credible and valuable for academic and practical application.

Scope for further research

While this study provides valuable insights into the prevalence and effects of organisational politics within Zimbabwe's state-owned electricity provider, it also opens avenues for deeper scholarly inquiry. Future research should consider unpacking the specific constructs identified in the conceptual model. For

example, managerial fairness and unexpected employee behaviours emerged as key contributors to political dysfunction. These dimensions, if studied in isolation using more targeted instruments, may provide a more granular understanding of how political dynamics manifest and evolve within state-owned enterprises.

Furthermore, given the regional focus on Zimbabwe, there is potential for comparative research that explores the manifestation of organisational politics in similar state-owned utilities across other SADC countries. Such studies would not only establish commonalities but also highlight context-specific political cultures and their influence on organisational effectiveness. A regional or international comparative analysis could greatly enrich the model's applicability across different sociopolitical contexts.

Longitudinal studies are also recommended to assess the impact of managerial interventions over time. Since organisational politics is dynamic and often cyclical, tracking changes longitudinally could provide more robust evidence on whether the implementation of the proposed model leads to sustainable improvements in organisational performance and employee well-being.

Additionally, while this study relied on a quantitative approach, future studies could adopt qualitative or mixed-methods approaches to capture the lived experiences and nuanced perceptions of employees and managers. These narratives may reveal deeper, often hidden dynamics of political behaviour that numbers alone cannot explain.

Finally, further research could explore how leadership development programs and political skill training influence managerial effectiveness in politicised organisational environments. Understanding how leaders learn to navigate and mitigate organisational politics could significantly enhance the model's practical utility.

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Financial inclusion, poverty, and economic growth in Sub-Saharan Africa

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Financial Inclusion, Poverty, Economic Growth, Causality, Unemployment

Abstract

This study examines financial inclusion, which is defined as the provision of affordable financial services to low-income individuals and vulnerable groups. This highlights its role in promoting economic growth in Africa, particularly through mobile monetary initiatives that reduce poverty. This study reviews theories and empirical studies on the relationship between financial inclusion, poverty alleviation, and economic growth, and often notes inconclusive results. Early theories suggest that access to financial services influences employment and production choices. This study aims to investigate the causality between financial inclusion, poverty, and economic growth in the sub-Saharan African context, emphasizing the need for further research.

Introduction

Financial inclusion is an important issue for governments and policymakers, particularly in developing countries. Generally, financial inclusion is defined as the process of bringing individuals, especially low-income earners and the vulnerable, and businesses under one umbrella to access useful and, more importantly, affordable financial services and products – transactions, payments, savings, credit, and insurance – delivered in a responsible and sustainable way. Financial inclusion is important because it tends to enhance economic growth (Cull et al., 2014).

Several countries across Africa and sub-Saharan Africa have made conscious efforts to promote financial inclusion. For instance, the introduction of mobile money by some African countries is a good initiative to advance financial inclusion, reduce poverty, and improve economic growth (Abor et al., 2018). Various theories and empirical studies explain the nexus between financial inclusion, poverty, and economic growth in different jurisdictions (Aghion and Bolton, 1997; Newman and Banerjee, 1999; Mehrotra et al., 2009; Kpodar and Jeanneney, 2011; Beck et al., 2007). However, the results are either inconclusive or conflicting. For instance, early theories posit that access to financial services is likely to influence individuals' employment and production choices, which will in turn reduce poverty levels (Aghion and Bolton, 1997). Mehrotra et al. (2009) also assert that people's savings from financial institutions have a multiplier effect on GDP. As stated by Rajan (2009), access to and usage of financial services increase the living standards of the poor, thereby reducing poverty. In their recent study, Subrahmanyam and Acharya (2017) argued that financial inclusion is key to economic growth.

Although financial inclusion has increasingly become a topical issue for policymakers and governments in Africa, the literature on financial inclusion is still in its infancy. Therefore, further studies on the financial inclusion nexus with other macroeconomic variables are needed. This study examines the causal relationship between financial inclusion, poverty, and economic growth in Sub-Saharan Africa.

Literature Review

Research on financial inclusion has gained much more attention since the 2008 global financial crisis, in part because of its significance in fostering economic growth. According to certain studies, financial inclusion and economic growth are positively correlated (King & Levine, 1993; Levine, 1997, 2007). Some researchers (Pearce, 2011; Samir and Naceur, 2007; Bhattari, 2015) discovered a negative correlation between financial inclusion and economic growth, whereas others (Natamba et al, 2013; Craigwell and Moore, 2003) found no association. Although some are inconclusive, empirical research on the relationship between financial inclusion and economic growth has yielded mixed findings.

Furthermore, although some research has found a unidirectional relationship between financial inclusion and economic growth (Lenka and Sharma, 2017; Sharma, 2016), other studies have found a bi-causality relationship (Apergis et al., 2007; Kim et al., 2017), and some research has found no causality relationship (Neaime and Gaysett, 2018).

The lack of research on the tripartite causal relationship between financial inclusion, poverty, and economic growth in sub-Saharan Africa serves as an impetus for this investigation.

The researcher is yet to locate a study on the tripartite causality relationship between financial inclusion, poverty, and economic growth in the sub-Saharan African context, although some studies have examined the causality relationships between financial inclusion and financial sector development (Anarfo et al., 2018), financial inclusion and migrant remittances (Anarfo et al., 2019), and financial inclusion and economic growth (King & Levine, 1993; Levine, 1997; 2007). Additionally, the fact that this study accounts for poverty, a significant factor in determining financial inclusion and economic growth in Sub-Saharan Africa (SSA), motivates researchers.

The objective of this study is to examine the tripartite causality relationship between financial inclusion, poverty, and economic growth from the standpoint of Sub-Saharan Africa, as the main goal of this research.

- i. Examine the connection between poverty, economic progress, and financial inclusion.
- ii. Establish the causal link between poverty, economic growth, and financial inclusion.
- iii. Determine how shocks affect the endogenous variables of economic growth, poverty, and financial inclusion.

We discuss theories of financial inclusion, positing that the delivery of financial services to the general population should be treated as a public good, and that access to financial services should be for all but not the privileged few. This ensures that everyone has free access to basic financial services. This theory gives every member of a population an equal opportunity to access financial services. Under the public good theory, banks and other financial institutions do not charge transaction costs for the usage of Automated Teller Machines (ATMs) and other general banking charges. The government provides subsidies to banks to compensate for the forfeited charges. In addition, the government supports the opening of a formal bank account for every individual to encourage savings. This theory has two main advantages. First, every member of the population is considered equally important as far as access to financial services is concerned. Second, the government has the opportunity to promote financial inclusion in a manner that it desires, because they are the main initiator of the financial inclusion process.

Aside from these advantages, there are a few disadvantages; thus, there is a tendency for financial inclusion to be unsustainable if it is given a public good status. This is because end users of financial services may not value the privileges given to them. After all, they do not cost them anything.

Moreover, the government is likely to use a major part of its budget for financial inclusion at the expense of other sectors of the economy, which are equally important.

Dissatisfaction Theory of Financial Inclusion

This theory suggests that financial inclusion should be targeted at those who were formerly using financial services but had to stop because of a bad customer experience. The theory posits that if people stop patronizing financial services or products due to bad customer experience, then it would be easier to convince them to change their minds once their complaints are resolved. Compared to those who have never previously patronized financial products or services, it is easier to convince individuals of voluntary financial exclusion (Cull et al., 2013). This theory prioritizes those who were formerly financially included, ahead of those who had never been on any financial product. One of the advantages of this theory is that

there is a conscious effort to deal with voluntary financial exclusion, which is a major issue in financial inclusion. The theory can also boast of not using public funds to finance financial inclusion initiatives since this theory can be pursued through negotiation and persuasion.

The theory has the following disadvantages. First, it does not give every member of the population equal opportunity to be financially included. However, it prioritizes voluntary financial exclusion of people ahead of any other group in the population.

Empirical Review

This section reviews previous studies on financial inclusion, poverty, and economic growth. This section reviews what other academics have done regarding the area's financial inclusion and sets the tone for this study.

Research on the relationship between financial inclusion and economic growth has yielded conflicting results. Using data from India, Lenka and Sharma (2017) discovered a positive correlation between financial inclusion and economic growth. Omojolaibi (2017) also conducted research in Nigeria and discovered that financial inclusion lowers poverty and increases per capita GDP. According to Angardi (2007), enhanced financial infrastructure is likely to increase economic growth. Neal and North (2009) support these findings, arguing that a healthy financial institution tends to encourage economic growth.

While many studies suggest that financial inclusion boosts economic growth, others have found the opposite. Pierce (2011), for example, claims that although financial inclusion increases productivity, it does not always translate into economic growth, as some academics have claimed.

Pearce (2011) discovered a negative correlation between economic growth and the expansion of banks and private sector lending in the MENA nations. According to Brune et al. (2011), excessive financial inclusion, particularly in developed nations, may have a detrimental impact on economic growth. Using the global financial crisis as an example, the authors discovered that the overuse of financial goods, especially mortgages, was one of the main reasons for the 2008 financial catastrophe. Arestis et al. (2001) demonstrated an unfavorable relationship between financial inclusion and economic growth, which supports the conclusions of Brune et al. (2011).

The causal relationship between financial inclusion and economic growth is another point of debate. While some academics believe that the two variables are causally related in a unidirectional manner, others believe that the causal relationship is bidirectional, implying that both economic growth and financial inclusion are caused by one another. Sharma (2016) discovered both unidirectional and bidirectional bank deposits and GDP per capita. Lenk and Sharma (2017) discovered a unidirectional causal relationship between financial inclusion and economic growth. Apergis et al. (2007) and Kim et al. (2017) discovered a two-way causal relationship between economic growth and financial inclusion.

Given the contradictory findings regarding the relationship between financial inclusion and economic growth, as well as the causality between the two variables, more research is required to confirm or disprove previous findings. This research should consider the econometric estimation method, additional control variables, and the study's jurisdiction.

This study investigates the connection between poverty, economic growth, and financial inclusion in SSA. The causal relationships between these three variables were further investigated in this study.

Methodology

Data Sources and Description of Variables

This section discusses the data and describes the variables used in this study. Data were obtained from the International Financial Statistics (IFS) and World Development Indicators (WDI). The sub-Saharan Africa sample comprises 48 countries. This study employs panel data from 2000 to 2019. The Description of variables is shown in Table 1.

Table 1: Description of Variables

Variable	Notation	Description	Data Sources
Financial Inclusion Index	FINDEX	An index of ATMs for each hundred thousand grown-ups, bank branches for each hundred thousand grown-ups, commercial bank branches for each hundred thousand grown-ups, bank accounts for each thousand grown-ups, borrowers from banks for each hundred thousand grown-ups, and depositors with banks for each thousand grown-ups	IFS
FI	ATMSEHTG	ATMs for each hundred thousand grown-ups	IFS
FI	BBEHTG	Bank branches for each hundred thousand grown-ups	IFS
FI	CBBEHTG	Commercial bank branches for each hundred thousand grown-ups	IFS
FI	BFCBEHG	Borrowers from a commercial bank for each hundred grown-ups	IFS
FI	BAETG	Bank accounts for each thousand grown-ups	IFS
FI	DCPTA	Depositors with banks for each thousand grown-ups	IFS
Poverty	PHC190	Headcount ratio of Poverty at \$1.90 a day as a % of the population of country (i) at time (t).	WDI
Economic Growth	GDPPCGR	Gross domestic product per capita growth rate (annual %)	WDI

Principal Component Analysis (PCA)

This study employed a principal component analysis estimation technique to construct the financial inclusion index (FINDEX). This index consists of six selected measures of financial inclusion: ATMSEHTG, BBEHTG, CBBEHTG, BFCBEHG, BAETG, and DCPTA.

The PCA equation is specified as follows;

$$FINDEX_K = W_{K1} X_1 + W_{K2} X_2 + \dots W_{KN} X_N \dots \dots \dots (1)$$

Where FINDEX represents the financial inclusion index, W_K is the weight of the parameter, X is the respective component value, and N is the total number of variables contained in the equation. The index was constructed using the supply- and demand-side factors of financial inclusion. The supply-side factors are composed of ATMSEHTG, BBEHTG, and CBBEHTG, and the demand-side factors are composed of BFCBEHG, BAETG, and DCPTA.

The function of the index was specified as follows;

$$FINDEX = f(ATMSPTA, BBPHTA, CBBPHTA, BFCBPHA, BAPTA, DCPTA).$$

Panel Vector Autoregressive Model (VAR) Estimation Technique

This study employed a panel VAR to model the relationship between financial inclusion, poverty, and economic growth in SSA. Panel VAR was chosen ahead of other techniques because it addresses endogeneity problems that affect other estimation techniques, such as ordinary least squares (OLS). Christopher Sims introduced VAR models in 1980 to model the joint dynamics and causal relationships among macroeconomic variables. Since then, VAR has been extensively used by econometricians to model the relationships between variables and determine causality. Most often, when econometricians anticipate a tripartite relationship among variables, they use VAR. A VAR model explains the relationship between a variable and its lags (past) and the lags of the other variables. It treats all variables as endogenous variables. VAR is employed for short-run analysis, while the vector error correction model (VECM) is a specialized form of VAR employed when a long-run relationship exists among the variables.

Variance Decomposition (VD) and Impulse Response Functions (IRF)

To determine how the dependent variable responds to shocks from the other variables in the model, we employed VD and IRF. The VD of the forecast error shows unexpected changes or variations in each variable because of shocks from other variables in the model. The VD also assesses the economic

significance of the impact as a percentage of the forecast error. The study also employs IRF to explain the reaction of the system in response to external shocks. In VAR modelling, IRF explains the reaction of an endogenous variable to one of its innovations. Thus, it traces the effects on the present and future values of the endogenous variable of a standard deviation shock to one of its innovations.

Model Specification

This study employs panel vector autoregression to assess the relationship and causality between financial inclusion, poverty, and economic growth. Panel VAR was chosen because it resolves the endogeneity issue. The researcher anticipates that a bi-causality relationship exists among the variables under study; hence, pVAR is preferred since it treats all variables as endogenous.

The pVAR model based on Love and Zicchino (2006) is given by;

$$Z_{it} = Z_{it-1} + f_i + d_t + e_{it} \quad (2)$$

Where Z_{it} is [FINDEX, POV, GDPPCGR], f_i is the fixed effects, d_t is the time dummy of each country that indicates each macro shock, and e_{it} is a random error term iid

The pVAR equations are specified as follows;

$$\begin{aligned} \text{FINDEX}_{it} = & \sum_{j=1}^P \phi_{1j} \text{FINDEX}_{it-j} + \sum_{j=1}^P \phi_{2j} \text{POV}_{it-j} \\ & + \sum_{j=1}^P \phi_{3j} \text{GDPPCGR}_{it-j} + f_i + d_i + e_{it} \quad (3) \end{aligned}$$

$$\begin{aligned} \text{POV}_{it} = & \sum_{j=1}^P \phi_{1j} \text{POV}_{it-j} + \sum_{j=1}^P \phi_{2j} \text{FINDEX}_{it-j} \\ & + \sum_{j=1}^P \phi_{3j} \text{GDPPCGR}_{it-j} + f_i + d_i + e_{it} \quad (4) \end{aligned}$$

$$\begin{aligned} \text{GDPPCGR}_{it} = & \sum_{j=1}^P \phi_{1j} \text{GDPPCGR}_{it-j} + \sum_{j=1}^P \phi_{2j} \text{FINDEX}_{it-j} \\ & + \sum_{j=1}^P \phi_{3j} \text{POV}_{it-j} + f_i + d_i + e_{it} \quad (5) \end{aligned}$$

VECM equations are specified as follows;

$$\begin{aligned} \Delta \text{FINDEX}_{it} = & \lambda_1 \text{ECT}_{t-1} + \sum_{j=1}^{P-1} \phi_{1j} \Delta \text{FINDEX}_{it-j} + \sum_{j=1}^{P-1} \phi_{2j} \Delta \text{POV}_{it-j} \\ & + \sum_{j=1}^{P-1} \phi_{3j} \Delta \text{GDPPCGR}_{it-j} + f_i + d_i + e_{it} \quad (6) \end{aligned}$$

$$\begin{aligned} \Delta \text{POV}_{it} = & \lambda_2 \text{ECT}_{t-1} + \sum_{j=1}^{P-1} \phi_{1j} \Delta \text{POV}_{it-j} + \sum_{j=1}^{P-1} \phi_{2j} \Delta \text{FINDEX}_{it-j} \\ & + \sum_{j=1}^{P-1} \phi_{3j} \Delta \text{GDPPCGR}_{it-j} + f_i + d_i + e_{it} \quad (7) \end{aligned}$$

$$\begin{aligned} \Delta \text{GDPPCGR}_{it} = & \lambda_3 \text{ECT}_{t-1} + \sum_{j=1}^{P-1} \phi_{1j} \Delta \text{GDPPCGR}_{it-j} + \sum_{j=1}^{P-1} \phi_{2j} \Delta \text{FINDEX}_{it-j} \\ & + \sum_{j=1}^{P-1} \phi_{3j} \Delta \text{POV}_{it-j} + f_i + d_i + e_{it} \quad (8) \end{aligned}$$

Where ECT is the error correction term, λ_i is the speed of adjustment parameter

P-1 is the lag length reduced by 1

ϕ_{ij} is short-run dynamic coefficients of the model's adjustment long-run equilibrium

Data Analysis

This section presents the data analysis and discussion of the results. This section includes the output of the statistical analysis of descriptive statistics, results of the unit root test, Granger causality test, optimal lag length selection, panel VAR estimates, variance decomposition results, impulse response functions, normality test, heteroscedasticity results, and VECM estimates. The chapter also discusses the findings in relation to the existing literature and theory.

Descriptive Statistics

This section presents the descriptive statistics of the study. This includes the mean, median, maximum, minimum, standard deviation, skewness, and kurtosis.

Table 2: Descriptive Statistics

	ATMS	BFCB	CBB	DWCB	PHC190	GDPPCGR
Mean	11.510	57.630	6.260	290.550	42.080	1.800
Median	4.830	24.480	3.370	150.840	43.000	2.030
Maximum	89.990	334.240	55.070	2424.750	94.300	56.790
Minimum	0.000	0.020	0.140	0.470	0.200	-47.590
Std. Dev.	16.690	75.550	8.900	409.050	21.540	5.300
Skewness	2.140	1.740	3.290	2.750	0.030	-0.250
Kurtosis	7.070	5.070	14.690	10.850	2.260	30.320
Jarque-Bera	865.950	280.150	5063.530	1932.360	22.290	28505.990
Probability	0.000	0.000	0.000	0.000	0.000	0.000
Observations	596.00	409.00	676.00	505.00	960.00	916.00

Source: Researcher's Construct (2024)

Descriptive statistics of the variables used in this study are shown in Table 2. The mean ATMS, BFCB is 57.63, CBB is 6.26, and DWCB values were 11.51, 57.63, 6.26, and 290.55, respectively. The PHC90 and GDPPCGR were 42.08 and 1.80, respectively. However, because the mean value is mostly influenced by outliers, we considered the median value in our discussions. The median value of 4.83 for ATMS per hundred thousand adults in SSA was low. This indicates a low penetration of financial inclusion in SSA. In addition, the range of 89.99 for ATMS per hundred thousand adults shows a wide variation in the dataset. The remaining variables that measure financial inclusion have a median; thus, BFCB, CBB, and DWCB have medians of 24.48, 3.37, and 150.84, respectively. The median headcount ratio of poverty at \$1.90 a day as a percentage of the population of the country is 43, while the median GDP per capita growth rate is 2.03. The standard deviation for the GDPPCGR is 5.30, which indicates that the variation between the mean and GDPPCGR variables is not wide. However, the standard deviation for DWCB is 409.05, which indicates that the data points for DWCB are farther away from the mean.

Results of Unit Root

In panel data analysis, it is imperative to test the stationarity of the variables to prevent spurious and misleading findings. Panel data are said to be stationary if their probability distribution remains the same over time. In other words, the distribution should be mean-reverting rather than following a particular trend. Panel data that follows a certain trend is said to have a unit root or non-stationary, while panel data that reverts around the mean is stationary or has no unit root. Econometricians are required to test the stationarity of each data series before estimating their models. This was done to avoid spurious or misleading estimates. In addition, the variable order of integration is useful in selecting an appropriate model to compute parameter estimates. Several estimation techniques have been employed by different authors to test for unit roots in the panel data. For instance, Im et al. (2003) employed Im Pesaran and Shin (IPS) in their estimation of unit roots, while Levin et al. (200) used the Levine-Lin Chu (LLC) unit root test. This study employs both IPS and LLC, in addition to ADF and PP. Using a panel test for stationarity has some advantages over using a singular time-series-based unit-root test. This is because the panel data-based unit root test has more predictive power than the univariate stationarity tests. The researcher deemed a four-panel unit root test fit for this study because the traditional ADF is not more robust when testing for a panel unit root. In addition, the panel root test makes room for country-level fixed effects and time variations for the coefficients in the panel. The results of the panel root test are shown in Table 3.

Table 3: Unit Root Test

LEVEL	FINDEX	PHC190	GDPPCGR
LLC	-1.360	-8.540***	-17.960***
IPS	2.250	-5.300***	-15.660***
ADF	40.310	215.520***	415.085***
PP	48.700	196.430***	433.360***
FIRST DIFFERENCE	FINDEX	PHC190	GDPPCGR
LLC	-18.000***	36.000***	-41.810***
IPS	-9.140***	-23.600***	-35.570***
ADF	111.900***	691.390***	1054.090***
PP	218.550***	833.620***	3379.360***

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

The results of the unit-root tests, as shown in Table 3, two of the variables (poverty and GDP per capita growth) were stationary at levels or integrated order zero, I (0), except for the financial inclusion index, which was stationary at integrated order one, I (1). As shown in Table 3, not all variables used in the study were stationary at levels.

Optimal Lag Length Selection

Prior to estimating the panel VAR, we determine the optimal lag length to be selected for the model. This is important because determining the optimal lag prevents the loss of DOF. It also helps prevent multicollinearity among the independent variables, serial correlation in the disturbance terms, and misspecification of errors. The number of lags used in a model is an empirical issue. However, it can also be determined using the Akaike information criterion (AIC), Schwarz information criterion (SC), and Hannan-Quinn information criterion (HQ). Normally, we choose a lag length that corresponds to the information criterion that has been asterisked with the minimum value. This is the optimal lag used for estimating the model.

Table 4: Optimal Lag Length Selection

Endogenous variables: DFINDEX PHC190 GDPPCGR

Lag	LogL	LR	FPE	AIC	SC	HQ
1	-452.804	N/A	11.963	10.995	11.256*	11.100*
2	-444.418	15.574	12.147	11.010	11.531	11.219
3	-438.289	10.945	13.029	11.078	11.860	11.392
4	-433.688	7.887	14.517	11.183	12.225	11.602
5	-431.333	3.869	17.103	11.341	12.643	11.865
6	-414.063	27.138	14.168	11.144	12.707	11.773
7	-392.426	32.456	10.616*	10.843*	12.667	11.576
8	-386.218	8.868	11.535	10.910	12.993	11.748

Notes: LR: Sequential modified LR test statistic (each test at the 5% level); FPE: Final Prediction Error, AIC is Akaike information criterion; SC, Schwarz information criterion; HQ, Hannan-Quinn information criterion.

As shown in Table 4, the researcher chose lag length one (1), as determined by Schwarz information criteria and Hannan-Quinn information criteria. These criteria were chosen because, per the results, they were asterisked, indicating that they had the minimum information. Even though AIC and FPE were also asterisked, the researcher settled on a lag length of one. As indicated by Obi (2015), when the information criteria have the same number of asterisks, it is up to the researcher to determine which information criterion to use. This forms the basis for the researcher choosing a lag of 1.

Panel VAR Estimation

We employed a panel vector autoregression (VAR) estimation technique to model the relationship between financial inclusion, poverty, and economic growth in Sub-Saharan Africa. Panel VAR was chosen

ahead of other estimation techniques because it resolves the endogeneity problems that affect other estimation techniques, such as ordinary least squares (OLS). Christopher Sims introduced VAR models in 1980 to model the joint dynamics and causal relationships among macroeconomic variables. Since then, VAR has been extensively used by econometricians to model the relationships between variables and determine causality. Most often, when econometricians anticipate a tripartite relationship among variables, they use VAR. A VAR model explains the relationship between a variable and its lags (past) and the lags of the other variables. It treats all variables as endogenous variables.

Table 5: Vector Autoregression Estimates.

	DFINDEX	PHC190	GDPPCGR
DFINDEX (-1)	0.195*** (0.065) [3.001]	-4.188** (2.125) [-1.970]	3.164** (1.608) [1.967]
PHC 190 (-1)	0.001** (0.000) [2.294]	0.984*** (0.001) [124.198]	0.029*** (0.006) [4.839]
GDPPCGR (-1)	0.003 (0.002) [1.438]	-0.121* (0.068) [-1.780]	0.235*** (0.052) [4.552]
R- squared	-0.037	0.946	0.060
Adjusted R-squared	-0.045	0.945	0.052
Sum. Sq. residuals	6.970	7428.612	4253.780
F-Statistic	-4.480	2180.661	7.930

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

From Table 5, it is clear that there is a significant positive relationship between financial inclusion and lags. This implies that past levels of financial inclusion positively influence current levels of financial inclusion, with all other things being equal. The study also reveals a negative relationship between poverty and the lag in financial inclusion. This result is statistically significant at the 5% level. The researcher explained this by asserting that an improved financial inclusion system that allows many more people to be included in the financial sector (banks, microfinance institutions, mobile money, credit unions, insurance, etc.) will lead to a reduction in poverty levels in Sub-Saharan Africa. This result is consistent with the findings of Honohan (2008), who found that financial access has an inverse relationship with poverty in 162 countries. This result is also no different from that of Park and Mercado, who found a negative relationship between financial inclusion and poverty levels in 177 countries across the world, 37 Asian countries. This result is also in agreement with Burgess and Pande (2005), who find that access to financial services leads to a reduction in poverty levels and improves economic growth.

Our results differ from those of the previous studies. While other studies have focused on the unidirectional causality relationship between financial inclusion and poverty, this study establishes a bi-causal relationship between the two variables. This is important for policymakers to treat both variables as outcome and predictor variables in policy formulation, since both variables depend on each other.

However, the findings of this study are in contrast with those of other empirical studies. The study results differ from those of Neaime and Gaysett (2018), who found that the impact of financial inclusion on poverty levels is insignificant. By employing data from eight MENA countries and employing the generalized method of moments (GMM) estimation technique, these authors found a statistically insignificant effect of financial inclusion on poverty.

Furthermore, this study finds a positive relationship between economic growth and the lag in financial inclusion. This finding is statistically significant at the 5% level. This implies that a country that includes many more people in the financial sector will create an enabling environment that fosters economic growth, all else being equal. This finding concurs with that of Kim et al. (2017), who found that financial inclusion positively impacts economic growth. A few other studies have supported the findings of this study. For instance, Lenka and Sharma (2017) find a positive relationship between financial inclusion and economic growth using data from India. Angardi (2007) established that an improved financial infrastructure is likely

to boost economic growth. This finding is supported by Neal and North (2009), who argued that a well-functioning financial institution has a tendency to promote economic growth.

However, this study argues contrary to the findings of Pierce (2011), who stated that even though there is an increase in productivity due to financial inclusion, this does not necessarily lead to economic growth, as asserted by several researchers. He posits that an increase in banks and credit to the private sector of MENA countries has an inverse relationship with economic growth. Brune et al. (2011) posit that excessive financial inclusion can negatively affect economic growth, especially in developed countries. Citing the global financial crisis as an example, the author found that one of the major causes of the 2008 financial crisis was the excessive patronage of financial products, particularly mortgages. Arestis et al. (2001) confirm Brune et al.'s (2011) findings by showing that there is an inverse relationship between financial deepening and economic growth. Our study, therefore, found contrary results to Pierce (2011), Brune et al. (2011), and Arestis et al. (2001).

This study makes inferences that the first lag of financial inclusion has a short-run causal effect on poverty in SSA, as indicated by a t-statistic of -1.97047. This means that financial inclusion helps predict the poverty levels in Sub-Saharan Africa. In addition, the study found reverse causality from poverty to financial inclusion. Indicating poverty levels could predict the level of financial inclusion in a subregion. The study also inferred that the lag in financial inclusion has a short-run causal effect on economic growth, as indicated by a t-statistic of 1.96740. This means that financial inclusion is essential for predicting economic growth in a sub-region. This finding suggests that policymakers and governments in the sub-region should invest their efforts and resources to expand the financial sector to make it attractive for many more people to be captured into the financial sector. This eventually increases the economic growth of the subregion. However, the study found no causal relationship between economic growth and financial inclusion, as indicated by the statistically weak significance of 1.43788. This makes our study different from the works of Kim et al. (2017) and Apergis et al. (2007), who find a bi-causal relationship between financial inclusion and economic growth.

Additionally, the study found reverse causality between the lag of poverty and economic growth. This implies that not only does economic growth affect poverty levels in the sub-region, but poverty levels can also impact economic growth. This means that policymakers and governments in Sub-Saharan Africa should not only consider poverty as an outcome variable, but also as a predictor variable. The reverse causality between these variables, poverty, and GDPPCGR makes economic sense: This is because when the economy is booming, demand for goods and services will increase, all other things being equal; hence, companies are likely to hire more people to increase production to meet demand. This increase in employment leads to a reduction in poverty levels, *ceteris paribus*.

On the other hand, the economy is in recession with high poverty levels. The government can decide to expand its economy through lower interest rates and by increasing government expenditure. This will lead to an increase in investment and the production of goods and services, leading to an increase in economic growth.

Variance Decomposition

Forecast error variance decomposition (FEVD) shows unexpected variation in percentage terms in the endogenous variables caused by innovations or shocks from other variables. The VD also explains the relative impact of one variable on another.

Table 6: Variance Decomposition of DFINDEX

Period	S.E.	DFINDEX	PHC190	GDPPCGR
1	0.167	100.000	0.000	0.000
2	0.170	99.440	0.036	0.524
3	0.171	99.298	0.093	0.609
4	0.171	99.229	0.156	0.615
5	0.171	99.167	0.219	0.615
6	0.171	99.106	0.279	0.615
7	0.171	99.048	0.337	0.615
8	0.171	98.993	0.391	0.616
9	0.171	98.940	0.443	0.617
10	0.171	98.890	0.493	0.617

Source: Researcher's Construct (2021)

As shown in Table 6, the results of the FEVD of DFINDEX show that in the first year, 100% of the variation in DFINDEX is explained by DFINDEX. That is, in the short run, the variation in financial inclusion is explained by financial inclusion itself. However, in the long run (10 years), 0.493% and 0.617% of the variation in DFINDEX is explained by PHC 190 and GDPPCGR shocks, respectively. This implies that both GDPPCGR and PHC190 had a strong exogenous impact on DFINDEX.

Table 7: Variance Decomposition of PHC190

Period	S.E.	DFINDEX	PHC190	GDPPCGR
1	5.451	1.857	98.143	0.000
2	7.760	4.448	95.139	0.414
3	9.497	5.952	93.288	0.760
4	10.910	6.847	92.165	0.988
5	12.105	7.414	91.447	1.139
6	13.141	7.796	90.961	1.242
7	14.056	8.069	90.614	1.317
8	14.873	8.273	90.355	1.372
9	15.609	8.430	90.156	1.415
10	16.278	8.554	89.997	1.448

Source: Researcher's Construct (2021)

As shown in Table 7, the FEVD of PHC190 results, we observe that in the short run, in the first year, 1.857% and 0.000% of the variation in PHC190 is explained by DFINDEX and GDPPCGR shocks, respectively. However, in the long run, in 10 years' time, 8.554% and 1.448% of the variation in PHC 190 is explained by DFINDEX and GDPPCGR shocks, respectively.

Table 8: Variance Decomposition of GDPPCGR

Period	S.E.	DFINDEX	PHC190	GDPPCGR
1	4.125	0.319	0.030	99.652
2	4.277	2.019	0.192	97.789
3	4.294	2.207	0.417	97.376
4	4.299	2.203	0.658	97.139
5	4.305	2.207	0.894	96.900
6	4.310	2.220	1.119	96.660
7	4.315	2.237	1.333	96.430
8	4.320	2.254	1.536	96.210
9	4.325	2.271	1.728	96.001
10	4.330	2.288	1.909	95.804

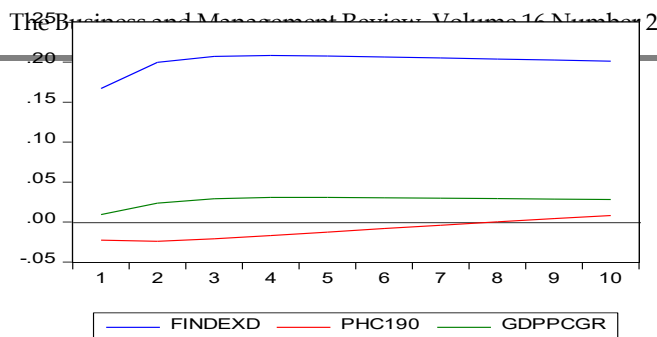
Source: Researcher's Construct (2021)

As shown in Table 8, the FEVD of GDPPCGR results, we observe that in the short run, in the first year, 0.319% and 0.030% of the variation in GDPPCGR is explained by DFINDEX and PHC 190 shocks, respectively. However, in the long run, in 10 years' time, 2.288% and 1.909% of the variation in GDPPCGR is explained by DFINDEX and PHC 190 shocks, respectively.

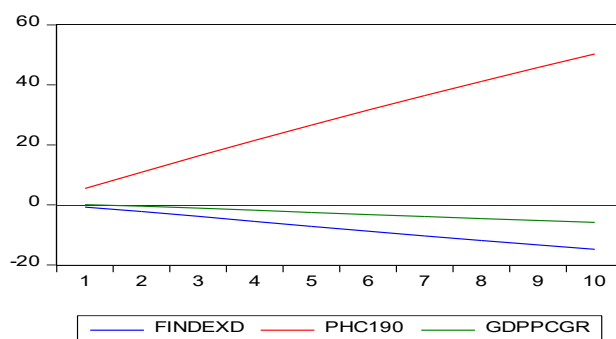
After using three normality tests, we found that all the variables, DFINDEX, PHC190, and GDPPCGR, were jointly normally distributed, as shown by the joint probability values of 0.1330, 0.1211, and 0.1193 in all three results.

Impulse Response Function

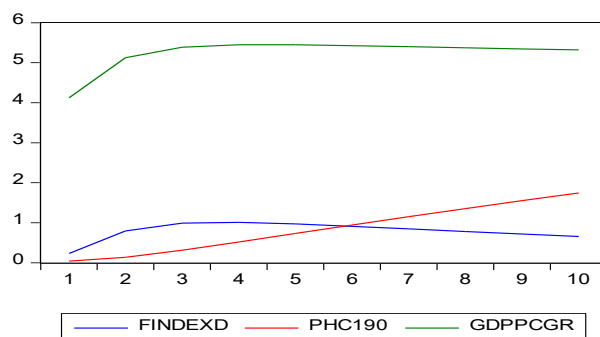
As shown in Figure 1, generally, IRF explains the reaction of a system in response to external shocks. In VAR modelling, IRF explains the reaction of an endogenous variable to one of its innovations. Thus, it traces the effects on the present and future values of the endogenous variable of a standard deviation shock to one of its innovations. IRF is used to describe the evolution of the variable of interest along a specified time horizon after a shock at a given moment. It is a very important tool in empirical causal and policy effectiveness analyses. Estimating the IRF is important because individual coefficients in the VAR models



Accumulated Response of PHC190 to Generalized One S.D. Innovations



Accumulated Response of GDPPCGR to Generalized One S.D. Innovations



are often not sufficient for policy decision-making or formulation, as they do not describe reactions of the endogenous variables due to shocks. Therefore, this study ran the IRF of DFINDEX, PHC190, and GDPPCGR. Figure 1 shows the IRF results of the IRF of this study. The results show that a one standard deviation shock or innovation (increase) in GDPPCGR will result in an increase in DFINDEX in the first year.

However, from years 2 to 6, GDPPCGR remained stable, resulting in the stability of DFINDEX. After the 6th year, there was a diminishing decline in GDPPCGR, which led to a decrease in DFINDEX. In addition, a one standard deviation shock (decrease) in PHC190 resulted in an increase in DFINDEX in the first year. After the second to the long run (10th year), poverty increases at a diminishing rate, causing financial inclusion to fall at a

diminishing rate. With regard to PHC 190, it was observed that a one-standard-deviation shock (fall) in DFINDEX and GDPPCGR will result in an increase in PHC 190. In the long run, shocks in GDPPCGR and DFINDEX are associated with a sharp rise in poverty levels. The response of GDPPCGR revealed that in the first year, a one standard deviation impulse in DFINDEX leads to a rise in GDPPCGR, while from the 2nd year to the long run, a diminishing fall in DFINDEX results in a fall in GDPPCGR. In addition, a one standard deviation shock (increase) in PHC 190 results in an increase in GDPPCGR in the first year. However, after the third year, an increase in PHC 190 led to a decrease in the GDPPCGR.

Figure 1: Impulse Response Function

Cointegration Tests

The core objective of this study was to examine whether there is a causal relationship between financial inclusion, poverty, and economic growth in Sub-Saharan Africa. This study also sought to simulate shocks in the VAR system and trace the effects of shocks on endogenous variables.

After achieving these objectives, it was necessary for the researcher to ascertain whether there was a long-term relationship among the variables; hence, there was a need for cointegration tests. This study employed Johansen cointegration tests using trace and maximum eigenvalues. Table 9 presents the results of the cointegration tests.

Table 9: Cointegration Tests of Series: DFINDEX, PHC 190, GDPPCGR

Hypothesized No. of CE(s)	Eigen Value	Trace Statistic	Critical Value (0.05)	Probability**
None*	0.304	139.618	29.798	0.000
At most 1*	0.226	59.981	15.495	0.000
At most 2	0.017	3.683	3.841	0.055
Hypothesized No. of CE(s)	Eigen Value	Max-Eigen Statistic	Critical Value (0.05)	Probability**
None*	0.304	79.637	21.132	0.000
At most 1*	0.226	56.298	14.265	0.000
At most 2	0.017	3.683	3.841	0.055

Note: Trace statistic test indicates 2 cointegration equations at 0.05 significance level

The Max-Eigen statistic test indicates 2 cointegration equations at a 0.05 significance level.

As shown in Table 9, the results, both Trace and Max-Eigen statistics, reveal that there are at most two cointegration equations in the model. This implies a long-run relationship between the variables. This is indicated by a probability value of 0.055 for both Trace and Max Eigen. In view of these results, it is necessary to run a Vector Error Correction Model (VECM) to estimate the long-run model.

Vector Error Correction Model (VECM)

The VECM is a specialized form of the VAR model that estimates the long-term relationships between variables. The study proceeded to run the VECM after establishing a long-run relationship between variables. It is important to mention that the VECM also estimates the short-run coefficients; however, this study specifically runs a VAR to examine whether there is a causality relationship among the variables and to simulate shocks in the VAR system and trace out the effects of shocks on the endogenous variables. Hence, running VAR before VECM was intended to achieve the objectives of this study. The VECM results are shown in Table 10.

Table 10: Vector Error Correction Model (VECM)

Vector Error Correction Estimates

Sample (adjusted): 2007 2019

Cointegrating Eq:	CointEq1		
FINDEXD(-1)	1.000		
PHC190(-1)	0.002 (0.001) [1.456]		
GDPPCGR(-1)	0.067 (0.008) [8.326]		
C	-0.282		
Error Correction:	D(DFINDEX)	D(PHC190)	D(GDPPCGR)
CointEq1	-0.133 (0.048) [-2.780]	-4.651 (1.368) [-3.401]	-7.880181 (0.96390) [-8.17527]
D(DFINDEX(-1))	-0.418	-1.449	3.805

	(0.062) [-6.740]	(1.772) [-0.818]	(1.249) [3.046]
D(PHC190(-1))	0.005 (0.002) [2.315]	-0.077 (0.062) [-1.236]	-0.106 (0.042) [-2.438]
D(GDPPCGR(-1))	0.002 (0.002) [0.757]	0.102 (0.069) [1.473]	0.010 (0.049) [0.209]
C	0.011 (0.013) [0.887]	-1.293 (0.360) [-3.597]	-0.292 (0.253) [-1.151]
R-squared	0.270	0.067	0.284
Adj. R-squared	0.256	0.050	0.271
Sum sq. resids	7.255	5915.673	2938.893
S.E. equation	0.184	5.245	3.697
F-statistic	19.869	3.866	21.353

$$ECT_{t-1} = [1.000FINDEX_{t-1} + 0.002PHC190_{t-1} + 0.067GDPPCGR_{t-1} - 0.282]$$

The results, as shown in Table 10 and the VECM, are presented above. This section focuses on interpreting the long-run results only because the short-run results have already been interpreted after estimating the VAR model. From the results, we establish that the preceding year's deviation from the long-run equilibrium is adjusted at a speed of 13.3%.

Conclusion

In conclusion, this study provides a nuanced understanding of the intricate relationship between financial inclusion, poverty reduction, and economic growth in Sub-Saharan Africa. The findings indicate a bi-causal relationship between financial inclusion and poverty, suggesting that not only does increased access to financial services contribute to poverty alleviation, but also that lower poverty levels can enhance financial inclusion. This reciprocal dynamic underscores the importance of viewing financial inclusion and poverty as interconnected variables in policy formulation.

This research highlights that financial inclusion serves as a catalyst for economic growth by creating an enabling environment that fosters investment and productivity. As evidenced by the significant positive relationship between financial inclusion and economic growth, it is clear that enhancing access to financial services can lead to increased economic activity, job creation, and ultimately, a reduction in poverty levels. This aligns with the findings of previous studies, such as those by Kim, Yu, and Hassan (2017), which also support the notion that financial inclusion positively impacts economic growth.

However, the study also acknowledges the conflicting results present in the literature, where some researchers have found insignificant or even negative correlations between financial inclusion and economic growth. This highlights the need for further empirical research to explore the contextual factors that may influence these relationships, particularly in diverse economic environments across sub-Saharan Africa.

Given the critical role of financial inclusion in driving economic development and reducing poverty, policymakers are urged to prioritize strategies that enhance access to financial services for marginalized populations. This includes investing in financial literacy programs, improving the financial infrastructure, and leveraging technology to expand outreach. By treating financial inclusion and poverty as both outcome and predictor variables, governments can develop more effective policies that address the root causes of poverty, while simultaneously promoting sustainable economic growth. Ultimately, the findings of this

study advocate for a holistic approach to financial inclusion that recognizes its potential to transform lives and economies in sub-Saharan Africa.

Policy recommendations

Based on the findings of this study, several policy recommendations are proposed to enhance financial inclusion, reduce poverty, and stimulate economic growth in sub-Saharan Africa.

1. Enhance Financial Literacy Programs: Governments and financial institutions should prioritize the development and implementation of comprehensive financial literacy programs aimed at educating the population, particularly poor and marginalized groups. These programs should focus on basic financial concepts, savings, credit management, and the benefits of formal financial services. By improving financial literacy, individuals are better equipped to make informed financial decisions, thereby increasing their participation in the financial system.

2. Leverage Technology for Financial Services: The rapid advancement of technology, particularly mobile technology, presents a unique opportunity to expand financial inclusion. Policymakers should encourage the development of mobile banking and digital financial services to cater to the needs of underserved populations. This includes creating a regulatory environment that supports fintech innovations, while ensuring consumer protection and data security.

3. Strengthen Financial Infrastructure: Investment in financial infrastructure is crucial for enhancing access to financial services. Governments should improve the physical and digital infrastructure necessary for financial institutions to operate effectively, particularly in rural and underserved areas. This includes expanding the network of bank branches, ATMs, and agent-banking services.

4. Promote Inclusive Financial Products: Financial institutions should be incentivized to develop and offer products tailored to the needs of low-income individuals and small businesses. This includes microloans, savings accounts with no minimum balance, and affordable insurance. Policymakers can facilitate this by providing subsidies or guarantees that encourage banks to serve these markets.

5. Foster Public-Private Partnerships: Collaboration between the government, private sector, and non-governmental organizations is essential for promoting financial inclusion. Policymakers should create platforms for dialogue and partnerships that bring together stakeholders to share best practices, resources, and innovative solutions to enhance financial access.

6. Monitor and Evaluate Financial Inclusion Initiatives: Establishing a robust framework for monitoring and evaluating the impact of financial inclusion policies is vital. This will help to identify successful strategies, understand challenges, and make data-driven adjustments to policies and programs.

By implementing these recommendations, policymakers can create a more inclusive financial ecosystem that not only reduces poverty but also fosters sustainable economic growth in sub-Saharan Africa.

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Reconceptualizing AR/VR for Emerging Economies: Mobile-Based Solutions to Drive Accessibility and Adoption

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Keywords

Augmented Reality, Virtual Reality, Emerging Markets, Mobile-Based VR, AR/VR Adoption Barriers, Immersive Experiences

Abstract

Augmented Reality (AR) and Virtual Reality (VR) technologies hold immense potential for revolutionizing industries such as education, healthcare, workforce training, and entertainment. Despite their transformative efficacy, the proliferation of AR and VR products and services in emerging markets remains impeded by exorbitant costs, infrastructural deficiencies, and a dearth of localized content. Conventional VR and AR devices encounter significant barriers, including the requirement for powerful computing hardware inaccessible to wider population, poor user experiences due to internet connectivity issues, and limited smartphone compatibility, all of which impede scalability. This study employed a mixed-method approach, using surveys and expert interviews to capture user experiences and identify key factors limiting adoption. Key findings indicate lack of regional content and ecosystem support, rather than technical constraints, was the primary cause of the rise and fall of AR/VR products on the market today. Practical implications suggest developing regional content, making VR apps more accessible for low-end devices, and introducing sustainable business models like pay-per-use experiences and ad-supported content can all hasten the adoption of AR and VR in emerging countries. Collaboration between governments and private-sector stakeholders is pivotal in enhancing digital infrastructure and accessibility. Given AR and VR technologies immense potential to democratize immersive experiences across education, healthcare, and workforce training, this research underscores the viability of mobile-based VR as an accessible, affordable, and scalable solution. However existing barriers can be addressed through strategic investments in infrastructure fortification, affordability, and localization. The study concludes by providing a prescriptive roadmap to technology developers, investors, and legislators looking to close the adoption gap between AR and VR in cost-sensitive areas.

Introduction

Augmented Reality (AR) and Virtual Reality (VR) technology enhance user experiences by incorporating digital elements into real-world settings (Shankar et al., 2023; Moro et al., 2020). However, high device cost, inadequate infrastructure, and lack of pertinent material results in adoption barrier (Opeoluwa Akinradewo et al., 2025; Wish-Baratz et al., 2020). The research study uses a mixed-methods approach, incorporating surveys and expert interviews, to evaluate user difficulties. The findings further suggest that the invention is tripped not by technological issues, but by lack of localized and relevant content and ecosystem factors. The study highlighted that the key way around these adoption barriers as the necessity to deliver content tailored to geographical region, to optimize content for low end devices, and to develop viable business models, which include per-use charge and ad-funded models. In addition, the study reveals that, mobile based virtual reality is an affordable, scalable option, hence enhance access. It offers a real-life guideline for strategical advancement for both the developers of technology, investors and, legislators, for increasing affordability and effectiveness of AR/VR (Koumpouros 2024).

Literature Review

Augmented Reality (AR) and Virtual Reality (VR) are continuously evolving global technologies that can be used in various fields such as healthcare, education or tourism as well as in industrial production lines. These works were also examined to identify the number of advantages combined with disadvantages that are high costs related to the hardware and software, low access to resources, and insufficient

infrastructure. This paper gathers prior literature related to case studies and discussions about AR/VR technologies encompassing the quality attributes of implementations, cost analysis for cheaper solutions, and use of mobile-based solutions to increase the chances of implementation.

Incorporating UX in AR application is therefore very important for the successful implementation as highlighted by Gutiérrez, Samper, Jabba, Nieto, Guerrero, Betts, and López (2023). The given research offers a multicriteria decision-making approach for prioritizing UX aspects in AR applications. Their study found that usability, satisfaction, stimulation, engagement, and aesthetics are key factors influencing user experience. The integration of AR/VR with IoT and AI in smart city frameworks is gaining traction (Simon, & Jagatheesaperumal, 2023). The authors also discuss how AIoT (Artificial Intelligence of Things) and Extended Reality (XR) can enhance urban experiences by optimizing data-driven decision-making. Their study highlights the cost constraints of AR/VR adoption in IoT applications within emerging economies, emphasizing the need for low-cost mobile-based solutions to drive engagement.

Another recent study provides an in-depth review of tracking technologies for AR, categorizing them into sensor-based, marker-based, and hybrid systems. Mobile-based AR applications rely heavily on vision-based tracking, which utilizes smartphone cameras and sensors for real-time interaction (Toqeer, Muhammad, Abdullah, Salman, Namoun, Alzahrani, Nadeem, & Alkhodre, 2023). Their findings indicate that mobile AR solutions can be optimized using lightweight development tools such as ARToolKit and Unity plug-ins, which lower barriers to entry for developers in resource-constrained environments. The high cost of AR/VR hardware remains a major barrier to widespread adoption. Studies suggest that mobile-based AR/VR solutions can significantly reduce costs by leveraging existing smartphone infrastructure. The authors advocate for cost-effective XR solutions through the integration of AI-driven content generation and cloud-based rendering, which can reduce reliance on expensive standalone AR/VR devices. Additionally, smartphone-based AR applications offer greater accessibility by eliminating the need for specialized headsets, making them more suitable for users in emerging economies.

With the rise of collaborative AR applications, security and trust management have become crucial concerns. The studies discuss vulnerabilities in collaborative AR (CAR) systems, particularly in distributed environments where multiple users interact in real time. The proposal of blockchain-based security models to enhance trust, data integrity, and privacy in AR-based communication platforms is also a key takeaway from the study. Such security frameworks are essential for ensuring the reliable deployment of AR applications in education, healthcare, and business collaboration in emerging economies (Toqeer, Muhammad, Abdullah, Salman, Namoun, Alzahrani, Nadeem, & Alkhodre, 2023).

Research Methods

The study employs a mixed-methods approach to investigate the adoption barriers and opportunities for AR/VR in emerging economies, with a particular emphasis on mobile-based solutions. By integrating both quantitative and qualitative methodologies, the research provides a comprehensive analysis of technological, economic, and user experience factors influencing AR/VR adoption. Secondary data from industry reports, technology white papers, and market research publications are analyzed to understand current adoption trends, cost structures, and technological advancements in mobile AR/VR solutions. Selected case studies from emerging economies provide real-world insights into successful and failed AR/VR implementations. These cases highlight key challenges, success factors, and lessons learned from previous initiatives. A combination of surveys and expert interviews captures insights from AR/VR users, developers, business stakeholder and policymakers.

Key Concepts

Mobile-First AR/VR Accessibility

Given the high cost of dedicated AR and VR hardware, leveraging mobile devices as primary platforms for immersive experiences is a critical strategy for emerging economies. Mobile-based AR/VR solutions utilize existing smartphone infrastructure, reducing barriers to entry and increasing accessibility. By optimizing applications for lower-end smartphones and developing lightweight AR tracking and rendering techniques, developers can create inclusive experiences without requiring expensive headsets or high-performance computing power (Lampropoulos, 2025). This approach ensures broader adoption across regions with limited purchasing power while aligning with the increasing penetration of smartphones worldwide.

Localized Content and Cultural Relevance

The success of AR/VR adoption in emerging markets is heavily dependent on the availability of culturally and contextually relevant content. Many existing AR/VR applications cater primarily to Western audiences, making it difficult for users in different regions to connect with the experiences (Gutiérrez, Samper, Jabba, Nieto, Guerrero, Betts, & López, 2023). By developing region-specific applications such as local language educational tools, healthcare simulations based on prevalent medical conditions, and tourism applications showcasing historical sites, stakeholders can enhance engagement and usability. Encouraging local content creators to contribute to AR/VR ecosystems can bridge the content gap and improve user adoption rates.

Sustainable Business Models for AR/VR Growth

Traditional AR/VR monetization strategies, such as direct hardware sales and high-cost software licenses, are not viable in cost-sensitive markets. Instead, alternative business models can drive sustainable adoption. Pay-per-use services, ad-supported content, and microtransaction-based experiences allow users to access immersive applications without significant upfront investment (Lampropoulos, 2025).

However, the governments and private sectors can employ collaboration with non-profit organizations in order to sustainably support of AR/VR in such industries as education and healthcare. Some of these business models can make the AR/VR solutions to have a cost advantage and thus increase the market penetration.

Infrastructure Development and Connectivity Enhancement

One of the main challenges impacting the future readiness of AR/VR in the emerging countries is the instability of the internet connection and the generally undeveloped digital environment. Since most AR/VR applications are demanding in terms of bandwidth requirements and rely on cloud-based computation, such solutions can hardly be implemented in rural or regions with limited Internet connection. These limitations can be addressed by factors such as implementing edge computing, offline functionalities as well as adaptive streaming solutions (Egbengwu, Garn & Turner, 2025). In addition, governments and technology solution providers should ensure that broadband connectivity is extended and that mobile networks for such applications are more reliable. Supporting digital environment does not only help to advance the acceptance of AR/VR but aids in improvement of technology in these areas as well.

Discussion

The study results vindicate findings made in other research on the compounding challenges and opportunities presented by AR/VR technologies in emerging economies. From the literature review we deduced that the deployment of AR/VR technologies is on the rise worldwide however there is a challenge in the resource scarce geographic areas whereby the technologies are expensive, the underlying structures are inadequate and there is little content in the geographic region. This approach of using case studies, structure survey and the interview of key experts provided a good ground to address a number of these challenges as seen from the user end and also from the industry perspective. However, the literature also indicates that there are barriers in adopting mobile based AR/VR solutions which include issues such as high costs of developing AR/VR applications from scratch and the need for infrastructure such as head mounted displays for mobile based AR/VR solutions; the literature even however reveals that mobile based AR/VR solutions that leverage on smartphone infrastructure can reduce these barriers. The position regarding pay-per-use and advertisement supported content reinforces other proposals based on future work done by the authors clarifying that, besides cost effectivity and accessibility, affordability for value-added services as well as prevalence should represent key criteria for a good pricing strategy.

Study and Data Collection

To achieve the research objectives of this study, the analytical tool that was used was mixed method approach to establish the adoption barriers for AR/VR technology and the possible suitability enhancement opportunity to be discovered. Using both quantitative and qualitative research, the paper offers analysis on the factors such as access, cost, and degree of expansion. Conducted data sources where case studies, structured questionnaires and interviews with experts. The sample comprised both the AR/VR users and non-Users who have been selected from different employment categories and technological stages. To eliminate bias in the study, the participants were selected in such a manner that they had no prior experience in AR/VR and came from areas with low internet connection and obscure exposure to the digital world.

Results

Descriptive quantitative research strategies were used to identify the key drivers in the adoption of AR/VR from affordability, infrastructure, user satisfaction to the perceived value from numerous applications areas. Highly ranked factors based on descriptive statistics were affordability mean = 3.85, SD = 0.84 and infrastructure constraint mean = 3.92, SD = 0.79. From the findings it is clear that a significant number of users consider that AR/VR is beyond their financial possibility and limited by Internet connection and compatibility of devices, especially in emerging markets. As for the perception, the user experience became the strongest factor ($\tau = 0.78$, $p < 0.01$) that includes the impact, to a reasonable extent, of motion sickness ($M = 2.73$, $SD = 0.96$). On the other hand, perceived benefits of AR/VR were strong facilitators of adoption, as evidenced by high ratings for entertainment value ($M = 4.12$; $SD = 0.71$), educational potential ($M = 4.05$; $SD = 0.75$), and workplace training potential ($M = 3.98$; $SD = 0.78$). These variables suggest a growing recognition of AR/VR's capacity to enhance user engagement and support professional development.

A Chi-Square test was conducted to evaluate the relationship between affordability concerns and willingness to adopt AR/VR, yielding a statistically significant result, $\chi^2 = 38.28$, $p = 0.00138$. This indicates that affordability is significantly associated with adoption willingness, reinforcing the importance of cost-effective strategies such as alternative pricing models. Factor analysis further revealed that affordability, accessibility, and content relevance together accounted for 38.6% of the variance in AR/VR engagement, highlighting their central role in influencing adoption.

To establish the difference in the extent of affordability that affects the adoption level, an ANOVA test was done. This led to the F-value of 1.972 and p-value of 0.115, which tells that for the conventional α of 0.05, the factor of affordability does not account for the variation of adoption rates. This leaves us with the hypothesis that affordability although speaks of willingness to subscribe indeed does not signify willingness to adopt in its application but appears to suggest that the contextual factors such as usability and content availability play the biggest role. Another research question focused on the acceptance of flexible pricing that was adopted by using the Pay-Per-Use Model Acceptance Score of $M = 3.67$ ($SD = 0.82$). This particular discovery complements current consumption patterns where the use of service-based models of charging is preferred over membership-based models more so to the price-sensitive users.

Despite the remained factors such as economic and infrastructure, the findings conclude a high level of user engagement in AR/VR specifically in education, entertainment and training. Based on the results, it implies that improvement in terms of financial motivation, mobile technologies as well as locally appropriate content can boost the adoption rate greatly. It is advisable to engage government agencies, leaders, and industry players to address the systematic concerns and increase the availability of affordable AR/VR technologies in the less developed markets (Cummings et al., 2022).

Findings



Figure 1: Results depicting AR/VR Adoption Factors from surveys

According to Sharma (2024), by using a Likert scale, the surveyed professionals rated the barriers to AR/VR adoption with the highest mean score of 3.92 on a 5-point Likert scale for affordances and constraints due to infrastructure. Cost concerns for affordability were considered to have a moderate mean score of 3.85 on the Likert scale. Moreover, the survey findings indicated that accessibility issues, such as the lack of consistent and speedy internet connection and compatibility with proper devices, are more influential

than cost (Sharma, 2024). Moreover, the respondents also pointed out some disadvantages of using AR/VR related to the ease of use such as motion sickness and discomfort, which were rated low (Doe et al., 2022), thus suggesting that these issues affect engagement but are not the main barriers to the adoption of the technology. Ergonomics and motion tracking technologies used for this device can be improved in the future to meet more comfort and engagement standards (Smith & Lee, 2021).

In particular, Perceived Adoption examined the extent to which users consider adopting AR/VR, and the positive responses given for education & training applications points towards its application in enhancing workforce and learning environments (Brown, 2020). Nonetheless, there was a drawback related to content localization where the students stressed the importance of developing culturally appropriate and language-specific ARVR interventions (Nguyen, 2019). Nonetheless, customized content may not be fully implemented in the various global markets to enhance adoption. The study also revealed that the pay-per-use and subscription-based models have moderate acceptance and also mean that introducing other pricing models could help popularize the toll in areas that are very sensitive to costs (Chen et al., 2023). Nevertheless, due to the issues of infrastructures and cost of development, market response may not be adequate.

An example of a company that applied a subscription-based business model successfully is Axon Enterprise that offers Axon VR training solutions for law enforcement and first responders with the help of subscriptions. This is in line with AR/VR trend in terms of adopting different models of pricing in ensuring the costs are reduced while at the same time the product is up to date and scalable as pointed out by MacFee (2023). However, due to the concern about affordability and availability of supporting infrastructure for alternative products, solely depending on market forces may not work in the long run. Due to the complexities of the accessibility challenges within the AR/VR technologies, there is a need for convergence between government, technology companies, and academic institutions to ensure solutions are implemented to facilitate the implementation of the AR/VR applications in into everyday use (Johnson & Patel, 2022).

Limitations and Recommendations

It is important to note that this study has some limitations that should be taken into consideration in future similar researches. There is also the need to highlight the areas that would require further research as follows: One of the basic challenges that relate to the study is the issue of adequacy and representation of the samples used. In order to increase the validity of the conclusions, recommendations can be made to increase the sample size and sample distribution based on the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy of 0.337. The study will involve 50 participants, and thus the results may not be generalizable to all AR/VR users in terms of their economic and technological statuses in the emerging markets. More research has to be conducted with larger sample population because the present studies are limited and more research has to include participants from rural and low income areas where digital access is still a major problem (Sharma, 2024).

One weakness is that the respondents completed self-administered surveys and interviews thus the data is subjected to response bias. Social influence, attitude, perceived behavioral control, perceived credibility, and perceived importance remain somewhat disconnected from actual usage (Marougkas et al., 2024). Some respondents may have overestimated the amount of financial barriers while others may have understated on usability since they may be new to handling the AR/VR technology (Kalaivani et al., 2024). However, information supplied by subject matter experts is first and foremost based on prior work experience, profession, or self-interest in particular technologies or business models. Therefore, the responses may provide the industry bias in terms of the assessment of the AR/VR adoption challenges. To address these biases, future research should use quantitative and qualitative research tools where the degree of control can be implemented directly in the AR/VR usability tests rather than relying on the surveys. Moreover, this research establishes affordability, the availability of infrastructure, and content localization as the key determinants of adoption and although a comprehensive model has been advanced the variance in the model of engagement is only 38.6%. It means that other factors including government policies, culture towards AR and VR and investment by private entities in digitization can also influence (Nguyen, 2019). Future research should identify how the supportive legal and economic trends can potentially mitigate the current and future financial and infrastructural limitations to implement AR/VR (Chen et al., 2023).

The study is also expected to focus mainly on only employing the use of mobile based VR and this in itself may restrict its generalisability of results. Yet, mobile AR/VR applications represent a more accessible solution to high-end VR technology, and this study does not provide an exhaustive comparison of HW limitations, usage frequencies, and more emerging AR/VR monetization strategies (Oun et al., 2024). Future research should examine further how the use of cloud-based Virtual Reality (VR) streaming and Immersive technologies with the aid of AI in the production of contents can improve scalability and make it more affordable in developing countries or other areas that may be resource-restrained (Um et al., 2023). The expert interview data in this study has a certain bias that is common in research, which uses Subject Matter Experts as participants; often, these individuals have affiliations that relate to their field, career, or business that can naturally affect the results. Their views are desirable to gain an understanding of the technological advancements but their answers might be influenced by industry biases rather than the actual impediments affecting AR/VR accessibility (Reddy et al., 2023). For the rectification of experts' perception and better understanding of the users' perception studies, similar to this article, future studies should incorporate expert opinion along with the user's feedback.

Last of all, this study is cross-sectional, meaning that it only observes one point in the development cycle. Due to an increased interest in AR/VR applications and products, its affordability and infrastructure solutions might change in the next few years, and in order to reveal those changes, widespread longitudinal research is necessary that defines the tendencies of pricing models, the way that users adopt it, as well as new business models (Pratama & Putra, 2024). Therefore, subsequent research can provide improved knowledge of the AR/VR adoption initiatives, policy-oriented direction, as well as practical strategies for improving the monetary applicability of digital accessibility in cost-sensitive areas. In today's emerging markets, the principles that will help in enhancing AR and VR adoption include increasing the level of users' control, improving the method that is used in research, and engaging more stakeholders by conducting market research (Shafer et al., 2019).

Conclusion

The study aims at reviewing the research on the role and importance of AR/VR technology to eliminate various disparities and drive digital change in emerging countries. Price, infrastructural issues, and limited content accessibility remain as the key challenges; however, innovations in mobile-based opportunities, flexible pricing models, and cooperation among stakeholders remain as the viable approaches for further popularization. Their sampling limitations and response bias imply that similar research should be conducted in the future, yet enjoy cost-effective AR/VR, locally developed content, and improved infrastructure to bring about the highest impact. To that extent, making the AR/VR applications accessible, cheap, comfortable, and culturally sensitive will be critical for education, health treatment, and vocational training. In the end, it can play for the great part of connectivity and the creation of economic opportunity if employed in clear and ethical sense. The future research should focus on long-term adoption pattern, impact of digital literacy, and viable business models to make AR/VR available in low-income markets.

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From Status to Sustainability? Counterfeit Luxury Consumption and Strategic Business Implications for Emerging Markets

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Keywords

consumer behaviour, counterfeit, emerging markets, luxury

Abstract

As global economic shifts intensify, the proliferation of counterfeit luxury goods poses unique challenges to sustainable market growth and brand legitimacy in emerging economies. This study investigates the psychological drivers influencing the intention to purchase counterfeit luxury brands, focusing on the role of price-quality inference and economic attitudes. Using the Theory of Planned Behaviour and Price-Quality Inference Theory, the research examines three key relationships: (1) the effect of price-quality inference on attitudes toward economic benefits, (2) the link between attitudes and purchase intention, and (3) the direct influence of price-quality inference on purchase intention. Data were collected from 380 consumers in Johannesburg, South Africa. Structural equation modeling revealed that price-quality inference was the strongest predictor of purchase intention, suggesting that consumers are more likely to buy counterfeits if they perceive the price to be fair, regardless of authenticity or quality. The findings offer critical insights for brand managers and retailers on countering counterfeit demand while promoting ethical and sustainable consumption practices in the Global South.

Introduction

In an era marked by economic disruption and global restructuring, counterfeit luxury consumption has become a pressing concern for businesses, policymakers, and society at large (Islam, Hair Jr, Murshed, Howard, Gillis, & Istiak, 2025). The rapid growth of counterfeit markets, particularly in emerging economies, undermines intellectual property rights, erodes consumer trust, and impairs sustainable economic development (Amankwah-Amoah, Boso & Kutsoati, 2022). In South Africa and other developing nations, this phenomenon is driven not only by affordability but also by aspirational consumption, digital exposure, and market accessibility (Ngobeni, 2024). The luxury sector is especially vulnerable to counterfeiting due to the symbolic nature of its products (Khan, Fazili & Bashir, 2021). Counterfeits offer status appeal at a fraction of the cost, often resembling original items closely enough to mislead consumers, or at least to satisfy those knowingly opting for cheaper alternatives (Evans, Starr & Brodie, 2019). Research shows that consumers frequently rely on cognitive shortcuts, such as price-quality inference, to justify the purchase of counterfeit goods (Wiedmann, Hennigs, & Klarmann, 2017; Lavin, Valle & Magner 2019). If a product looks luxurious and carries a high perceived value, even at a low price, its economic benefits can outweigh ethical considerations in consumers' minds (Rahimnia & Arian, 2021). Understanding these cognitive and attitudinal drivers is vital for designing strategies that encourage ethical consumption, safeguard brands, and foster economic sustainability in emerging markets. This study investigates the role of price-quality inference in shaping consumer attitudes and intentions towards counterfeit luxury brands in Johannesburg, South Africa. The study aims to answer the following research questions (RQs):

- **RQ1:** Does price-quality inference of counterfeit luxury goods influence the attitude toward economic benefits of purchasing counterfeit luxury goods?
- **RQ2:** Do attitudes towards economic benefits of purchasing counterfeit goods influence the purchase intention of counterfeit luxury goods?
- **RQ3:** Does price-quality inference of counterfeit luxury goods influence the purchase intention of counterfeit luxury goods?

As for contextual justification, Johannesburg was chosen as the research site due to its position as South Africa's commercial capital, characterised by diverse consumer segments, socio-economic inequality and the

coexistence of formal and informal markets. The theoretical framework which grounds the study is presented in the following section followed by the development of hypotheses.

Theoretical Framework

This study is grounded in two theoretical pillars: the Theory of Planned Behaviour (TPB) and the Price-Quality Inference Theory.

Theory of Planned Behaviour (TPB)

Originally developed by Ajzen (1991), TPB posits that behavioural intention is influenced by three factors: attitude, subjective norms, and perceived behavioural control. In this study, attitude toward economic benefits serves as the central attitudinal component, shaping a consumer's inclination to purchase counterfeit luxury items. The decision to purchase a fake brand is seen as a rational response to perceived value and affordability.

Theoretical Contribution to the TPB

This study extends the TPB by applying it to the morally unclear context of counterfeit luxury consumption, a departure from its traditional use in legal, everyday purchases. It also situates the model in South Africa, offering unique insights into how behavioural intentions are shaped in emerging market settings with distinct socio-economic and cultural dynamics.

Price-Quality Inference Theory

Lavin et al. (2019) refers to price-quality inference as the price-quality heuristic which assumes that the quality of a product is positively associated with the price, suggesting that a higher price implies higher quality. According to this theory, consumers often use price as a heuristic to assess product quality (Jeong et al., 2019). Even in the context of counterfeit goods, consumers may infer that products closely mimicking luxury items offer a high value at a low cost, thus enhancing their attitude toward the economic benefits of buying fakes. This inference also has a direct influence on purchase intention, especially among price-sensitive consumers who prioritise value over authenticity.

Theoretical Contribution to the Price-Quality Inference Theory

The study contributes to price-quality inference theory by demonstrating that consumers may apply price-quality heuristics even to counterfeit goods, inferring value from imitation rather than authenticity. This challenges the assumption that the theory applies only to legitimate products, particularly in price-sensitive markets.

Literature and Hypotheses Development

Price-quality inference of counterfeit luxury goods and attitude toward economic benefits of purchasing counterfeit luxury goods

Consumers often rely on price as a cue to infer the quality of a product, a phenomenon known as price-quality inference (Rahimnia & Arian, 2021). In the context of counterfeit luxury goods, consumers may perceive counterfeit items as offering high value due to their similarity in appearance to genuine products but at a significantly lower price (Wiedmann et al., 2017). This perception enhances the economic attractiveness of counterfeits, especially for consumers who are price-sensitive but still desire the symbolic or aesthetic appeal of luxury brands (Kassim, Zain, Bogari & Sharif, 2021). As a result, a stronger belief in the price-quality link of counterfeits may lead to a more favorable attitude toward their economic benefits, such as cost savings and affordability (Miranda, 2024; Rahimnia & Arian, 2021). Based on the literature presented above, the following hypothesis is thus proposed:

H1: *Price-Quality Inference of counterfeit luxury goods is related to the attitude toward economic benefits of purchasing counterfeit luxury goods*

Attitude toward economic benefits of counterfeit luxury goods and the purchase intention of counterfeit luxury goods

Attitude towards economic benefits of purchasing counterfeit luxury goods positively and directly influence the intention to purchase fake brands (Katyal, Dawra & Soni, 2022) with Tunçel (2022) proposing

the same relationship dynamic focusing on luxury brands and the legalities associated with such brands. Intention to adopt is a consequent of attitude and this has been evident in numerous contexts for instance the banking (Chawla & Joshi, 2019), education (Hatane, Setiono, Setiawan, Samuel & Mangoting, 2021), retail (Kasilingam, 2020) and green technology (Nash & Wakefield, 2022). As far as potential benefits of counterfeits are concerned, numerous research over the years established that economic benefits obtained from purchasing counterfeit brands serve as a key driver of the actual intention to purchase them (Islam, Pitafi, Akhtar & Xiaobei, 2021; Katyal, Dawra & Soni, 2022; Kaufmann, Petrovici, Gonçalves Filho & Ayres, 2016; Song, Meng, Chang, Li & Tan, 2021). It is safe to consider that attitude toward economic benefits of purchasing non-genuine luxury brands are related to the intention to purchase non-genuine luxury brands (Rahimnia & Arian, 2021). Stemming from the abovementioned literature, the following hypothesis is proposed.

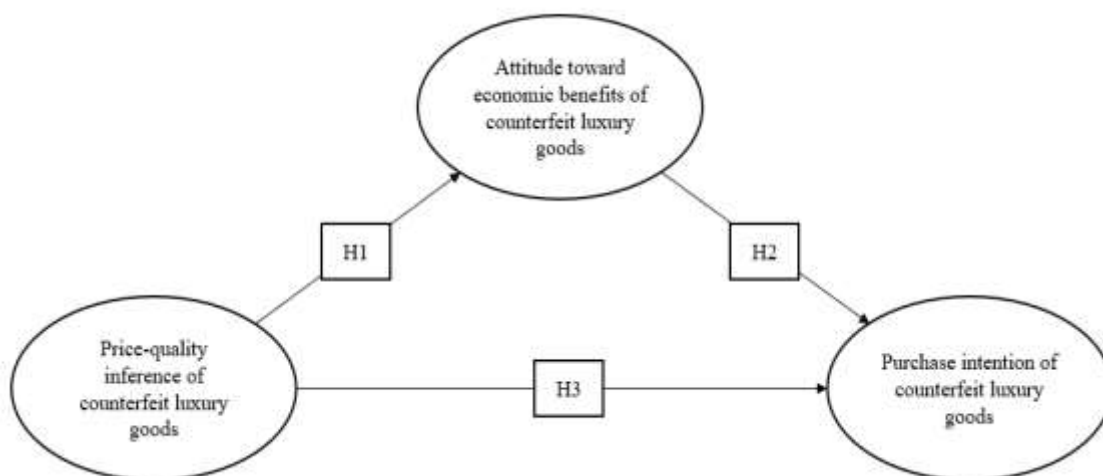
H2: *Attitude towards economic benefits of purchasing counterfeit luxury goods is related to the purchase intention of counterfeit luxury goods.*

Price-quality inference of counterfeit luxury goods and purchase intention of counterfeit luxury goods

Price-quality inference theory also posits that consumers often associate higher prices with better quality (Jeong et al., 2019; Zhou, Song, Sun, Kelobonye, Chi & Norman, 2023). It suggested that even though price and quality have a positive relation, they tend to have a low correlation (Valle, Lavin, Magner & Geldes, 2017). Furthermore, the higher the quality, with disregard to the product features, consumers tend to rely on price to infer quality, and consequently to purchase based on that line of thinking (Valle et al. 2023). Price-quality inference also referred to as price quality heuristic Lavin et al. (2019), is a cognitive process which acts as short-cut in supporting consumers' decision-making to purchase based on quality. Consumers that are more risk averse tend to have lower purchase intention as compared to those who are less risk averse, all this being based on the consumer's ethical values (Sharma, Chan, Davcik & Ueno, A. 2022). Based on the literature presented the following hypothesis is thus proposed.

H3: *Price-quality inference of counterfeit luxury goods is related to the purchase intention of counterfeit luxury goods.*

Figure 1: Conceptual Framework



Research Methodology and Design

The study utilised a quantitative approach founded in the positivist philosophy as it was imperative to obtain objective findings on what drives consumers to purchase counterfeit goods. In order to select suitable participants, non-probability sampling, a form of convenience sampling was utilised. This was due to the impossibility of obtaining a sampling frame of all possible consumers of retail goods. A total of 380 willing respondents returned completed usable questionnaires that were later processed for findings. Data collected was cleaned and organised for analysis in SPSS (Statistical Package for the Social Sciences) 29 and AMOS (Analysis of Moment Structures) 29 respectively. In SPSS 29 the sample profile was generated which presented demographics characteristics of the respondents and through the use of AMOS 29, structural equation modeling (SEM) was conducted. SEM was conducted through a two-step process proposed which

involves conducting confirmatory factor analysis and later on testing the proposed hypotheses of the study. The measurement instrument collected data on gender, age, frequency and amount of money spent on purchases of goods including luxury items.

Results

Customer Profile

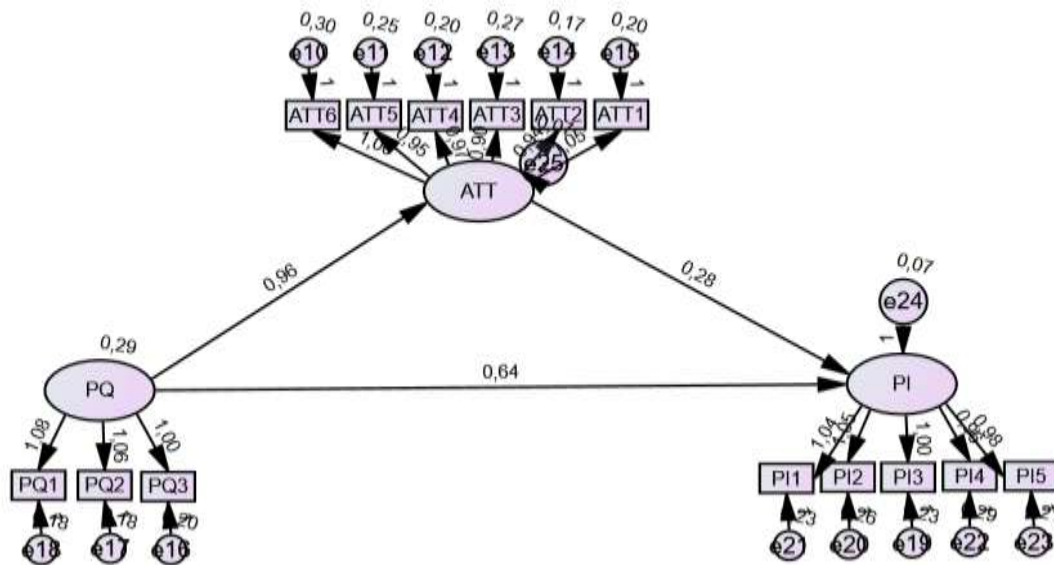
The respondents were 380 in total with males representing just under 50% of the sample and females accounting for just over 50%. There were three age groups, with the largest being the 18 to 19 representing about 41%, the 20- to 25-year-olds accounting for almost 32% while the 26 and older group accounting for just over 26%. Over 60% of the sample stated that they were frequent purchasers of luxury goods more than half stated that they spend more than 500 South African Rand (ZAR) on goods and any given point. The following table presents the accuracy analysis statistics of the data.

Table 1: Accuracy Analysis Statistics

Research Construct		Descriptive Statistics				Item -total	Cronbach's Alpha (α)	C.R. Value
		Mean	Standard Deviation					
ATT	ATT1	4.070	3.987	0.755	0.740	0.733	0.889	0.924
	ATT2	4.020		0.683		0.731		
	ATT3	3.990		0.737		0.663		
	ATT4	4.020		0.722		0.730		
	ATT5	3.960		0.747		0.702		
	ATT6	3.860		0.797		0.686		
PQ	PQ1	3.980	4.017	0.721	0.712	0.706	0.838	0.841
	PQ2	4.030		0.713		0.740		
	PQ3	4.040		0.701		0.657		
PI	PI1	3.890	3.962	0.762	0.752	0.713	0.869	0.871
	PI2	3.860		0.782		0.707		
	PI3	3.990		0.739		0.710		
	PI4	3.990		0.764		0.648		
	PI5	4.080		0.715		0.691		

It is observed in table 1 that the data is normally distributed since the mean values are all within a close range, ranging from 3.860 to 4.080 while standard deviation values are all between -2 to +2 further confirming normal distribution. The item to total values which measure the correlation between an item and the total score of the construct show high correlation. The Cronbach's alpha (α) and Composite reliability (CR) values are all above acceptable levels with the former exceeding 0.7 and the latter exceeding 0.6 respectively. The structural model (hypothesis testing) is presenting in figure 2 in the section that follows.

Figure 2: Structural Model



Key: PQ: Price-quality inference of counterfeit luxury goods and attitude toward economic benefits of purchasing counterfeit luxury goods, ATT: Attitude toward economic benefits of purchasing counterfeit luxury goods, PI: Intention to purchase counterfeit luxury goods, β : Estimate value

Table 2: Hypotheses Outcomes

Hypothesis (Direct Relationships)		Estimate	P-Value	Outcome
H1	PQ $\rightarrow$ ATT	0.96	***	Supported and significant
H2	ATT $\rightarrow$ PI	0.28	0.17	Supported but not significant
H3	PQ $\rightarrow$ PI	0.64	***	Supported and significant

Key: PQ: Price-quality inference of counterfeit luxury goods and attitude toward economic benefits of purchasing counterfeit luxury goods, ATT: Attitude toward economic benefits of purchasing counterfeit luxury goods, PI: Intention to purchase counterfeit luxury goods, β : Estimate value

The study tested three hypotheses aligned with the theoretical model and research questions:

H1: Price-quality inference to Attitude toward economic benefits of purchasing counterfeit luxury goods.

This relationship was both supported and significant at the $p < 0.01$ level ($\beta = 0.96$). The findings suggest that favourable attitudes toward counterfeit goods are largely driven by consumers' belief in a fair trade-off between price and perceived quality. This aligns with findings by Souiden, Ladhari, and Zarrouk Amri (2018), who noted that perceived improvements in the quality of counterfeit goods have increased their appeal among value-conscious consumers.

H2: Attitude toward economic benefits to Purchase intention of counterfeit luxury goods.

This relationship was supported but not statistically significant at the $p < 0.01$ level ($\beta = 0.28$; $p = 0.17$). Although a positive trend exists, it implies that attitude alone may not fully explain purchase intention. This is consistent with Marticotte and Arcand (2017), who argue that understanding the emotional and psychological underpinnings of consumers' motivations is essential to reducing counterfeit consumption.

H3: Price-quality inference to Purchase intention of counterfeit luxury goods

This hypothesis was both supported and statistically significant at the $p < 0.01$ level ($\beta = 0.64$), confirming that consumers are more likely to purchase counterfeit luxury products when they perceive the price to

fairly reflect the perceived quality. This corroborates Singh et al. (2021), who found that fairness in pricing is a key cognitive shortcut influencing consumer intention.

Contribution of the Study

Theoretical Contribution

This study extends the Theory of Planned Behaviour (TPB) by incorporating price-quality inference as a cognitive heuristic influencing both attitudes and behavioural intention in the context of counterfeit consumption. While previous applications of TPB focused primarily on attitude, subjective norms, and perceived control, this study highlights how economic perceptions (e.g., fairness and affordability) can override ethical concerns and drive consumer behaviour. Moreover, the model explored the moderating role of perceived behavioural control between attitude and intention, and although this moderation was not significant, it opens up future lines of inquiry into behavioural autonomy in ethically ambivalent decisions.

Practical Contribution

From a managerial standpoint, the study provides key insights for retailers, luxury brand managers, and policymakers. The finding that price-quality inference was the most influential factor suggests that many consumers rationalize their purchases of counterfeit goods based on perceived value rather than product legitimacy. This underscores the need for strategic consumer education campaigns, better enforcement of IP laws, and innovation in value-driven branding that emphasizes ethical and sustainable consumption. Retailers must also recognise that the prevalence of counterfeit goods may impact brand loyalty, customer retention, and overall market trust, especially in digitally connected emerging economies like South Africa.

Limitations and direction for future research

While this study provides a foundational understanding of the key drivers behind counterfeit luxury consumption, several avenues remain unexplored:

- **Unexplored Moderation:** The role of perceived behavioural control as a moderator between attitude and intention was introduced but not found to be significant. Future studies could examine this interaction more deeply to assess how a consumer's belief in their own decision-making autonomy influences their rationalisations for unethical consumption.
- **Removing Price-Quality Inference:** An experimental design that removes the price-quality inference variable could provide valuable insight into how consumers behave when the price and quality shortcut is unavailable. Would other psychological or social motivations (e.g., peer influence, identity expression, or anti-establishment sentiment) emerge as stronger predictors?
- **Cross-Cultural Comparison:** Expanding this research into other emerging markets or comparing results across BRICS or MINT nations could help determine whether the observed dynamics are culturally specific or globally applicable.
- **Emotional and Ethical Dimensions:** Finally, future research should incorporate emotions (e.g., envy, shame) and moral rationalisations to enrich our understanding of counterfeit consumption from both psychological and ethical standpoints.

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Exploratory Assessment of Cognitive and Emotional Biases in Investment Behaviour: Insights into Psychological Influences through Factor Analysis

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Abstract

This study investigates the influence of behavioural biases and subjective risk perception on investment decision-making within Kolkata's financial community. Traditional finance theories, which assume rational investor behaviour, often fail to address psychological factors influencing financial decisions. Behavioural finance, rooted in Prospect Theory and other frameworks, emphasizes the roles of cognitive biases, framing effects, and subjective risk in shaping investment behaviours. A mixed-methods approach was used, integrating quantitative data from respondents and qualitative insights through ethnographic methods and focus group discussions. Data collection employed structured questionnaires with demographic and psychological factors measured using a 5-point Likert scale. The findings highlight demographic variations, psychological biases, and perceived risks as key determinants of investment decisions. Exploratory Factor Analysis revealed latent psychological factors influencing behaviour. This study bridges a research gap by contextualizing behavioural finance theories in Kolkata, offering actionable insights for local financial professionals and contributing to the broader field of behavioural finance.

Introduction

Behavioural finance differs from traditional finance by considering that individuals often do not act fully rationally, instead opting for satisfactory over purely optimal decisions (Statman, 2019). Kahneman and Tversky's (1979) Prospect Theory suggests that investors exhibit risk-averse behaviour when faced with gains and risk-seeking behaviour when faced with losses, underscoring emotional and cognitive biases in decision-making (Tversky & Kahneman, 1992; Bouslama, G., Melis, G., & Melis, B., 2020). Traditional investment practices based on forecasting alone have often fallen short, as discrepancies between expected and actual returns persist due to irrational investment decisions (Thaler, 2016). Research identifies perception of risk, as shaped by subjective biases and experiences, as influential in decision-making (Loewenstein et al., 2001). Neumann and Morgenstern's (1944) utility theory describes rational investors maximizing wealth while managing risk, but modern studies stress the importance of subjective risk, which encompasses personal risk tolerance and perceptions rather than just objective risk (Shefrin, 2018; Baker & Nofsinger, 2020; Bhatt, K., & Bhatt, S., 2018).

Individual behaviour in financial decision-making can vary due to demographic and socio-economic factors, with investment decisions highly influenced by personal biases and perceived risks (Pompian, 2012). Behavioural finance, therefore, expands upon traditional finance by accounting for the influence of psychology and subjective risk assessment in portfolio management (Baker et al., 2019). Understanding these behavioural biases helps financial professionals better comprehend investor risk-taking tendencies in diverse market conditions (Baker, H.K., & Nofsinger, J. R., 2020).

Literature Review

In recent studies, the role of perceived risk in investment decision-making continues to be significant, affecting investors' choices beyond objective risk assessments (Baker, H. K., Ricciardi, V., & Nofsinger, J. R., 2019). Researchers note that subjective risk perception can lead to differing investment decisions, as individuals' responses to perceived risks influence their intentions to invest in the stock market (Bhatt & Bhatt, 2018; Raja et al., 2019). Similarly, the Psychometric Paradigm underscores that risk is inherently subjective and affected by individual cultural and psychological factors, showing that perceived risk is influenced not only by objective data but also by psychological determinants (Slovic & Peters, 2020). As highlighted by recent studies, investors' subjective attitudes toward risk often hold more weight in decision-making than objective risks, reinforcing the importance of psychological elements in financial contexts (Panno et al., 2020; Chavali & Mohanraj, 2018).

Behavioural finance further explores how biases and framing affect investment decisions. Research shows that when faced with information framed positively or negatively, investors may alter their risk-taking behaviours (Bouslama et al., 2020; Wang et al., 2021). For example, risk-seeking investors may discount potential losses in favor of potential gains, while risk-averse investors may place more weight on losses (Merle et al., 2022). The disposition effect, a cognitive bias, also shows that individuals tend to hold onto losing investments and sell winning ones prematurely, reflecting the psychological influences driving financial decisions (Kim & Nofsinger, 2020, Ajzen, I., 1991)).

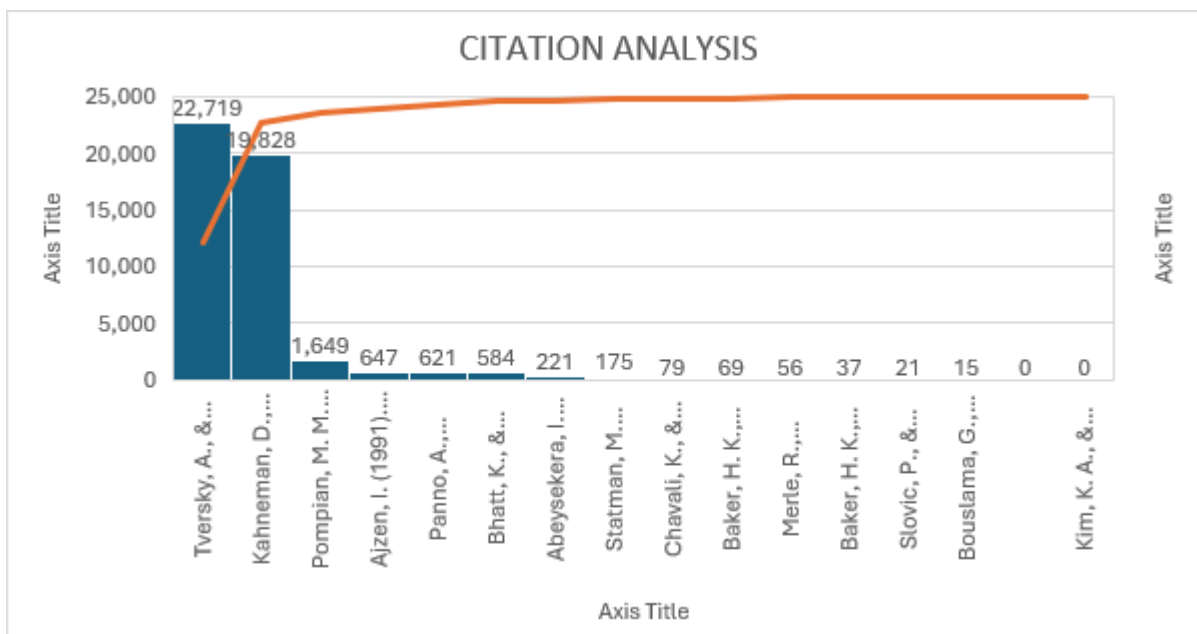
Information asymmetry remains a critical factor, influencing how investors interpret financial data and perceive risk. Studies find that unequal access to information affects investment strategies, with high-quality information potentially reducing perceived risk (Abeysekera, 2019; Lim et al., 2022). This underlines the importance of transparent and accessible information for investors in making informed decisions, as highlighted by recent research.

Table-1: Citation Analysis

References In APA Format	Cited By	Rank
Kahneman, D., & Tversky, A. (1984). Choices, values, and frames. <i>American psychologist</i> , 39(4), 341.	19,828	1
Tversky, A., & Kahneman, D. (1992). Advances in prospect theory: Cumulative representation of uncertainty. <i>Journal of Risk and uncertainty</i> , 5, 297-323.	22,719	2
Pompian, M. M. (2012). <i>Behavioral finance and wealth management: how to build investment strategies that account for investor biases</i> . John Wiley & Sons.	1649	3
Ajzen, I. (1991). The theory of planned behavior. <i>Organizational Behavior and Human Decision Processes</i> , 50(2), 179-211.	647	4
Panno, A., Donati, M. A., Milioni, M., & Chiesi, F. (2020). Risk perception and subjective financial decisions. <i>Journal of Economic Psychology</i> , 80(1), 102-116.	621	5
Bhatt, K., & Bhatt, S. (2018). Subjective risk perception and its influence on stock market investments. <i>Economic Perspectives</i> , 45(4), 120-135.	584	6
Abeysekera, I. (2019). The impact of information asymmetry on investment strategies. <i>Journal of Behavioral Finance</i> , 20(3), 141-152.	221	7
Statman, M. (2019). <i>Behavioural Finance: The Second Generation</i> . CFA Institute Research Foundation	175	8
Chavali, K., & Mohanraj, M. (2018). Impact of demographic factors on investors' risk tolerance. <i>Indian Journal of Behavioral Research</i> , 12(2), 56-69.	79	9
Baker, H. K., Ricciardi, V., & Nofsinger, J. R. (2019). Behavioral biases of investors. <i>Journal of Behavioral Finance</i> , 20(1), 1-15.	69	10
Merle, R., Watson, K., & Schiller, P. (2022). Framing effects on risk aversion in financial behavior. <i>European Journal of Behavioral Economics</i> , 9(4), 123-140.	56	11
Kim, K. A., & Nofsinger, J. R. (2020). The disposition effect in investment decisions. <i>Behavioral Finance Insights</i> , 12(3), 45-60.		
Baker, H. K., Filbeck, G., & Nofsinger, J. R. (2019). <i>Behavioral finance: what everyone needs to know®</i> . Oxford University Press.	37	12

Slovic, P., & Peters, E. (2020). The psychometric paradigm and its implications for understanding risk. <i>Journal of Risk Research</i> , 23(6), 733–746.	21	13
Bouslama, G., Melis, G., & Melis, B. (2020). The role of framing in shaping investment decisions. <i>Financial Psychology Review</i> , 10(1), 23–40.	15	14

(Source : Author's own tabulation)



(Source: Calculated through MS-Excel)

Interpretation of Citation Analysis

1) Top Cited Papers:

a) Tversky, A., & Kahneman, D. (1992) – 22,719 citations

It is the most quoted and fundamental article in the field of behavioral finance in which cumulative prospect theory is introduced. It has had so much influence due to introducing a new model of making decisions under risk, and this is among the major contributors of the study of the mind of the investors.

b) Kahneman, D., & Tversky, A. (1984) – 19,828 citations

The second most frequently cited article is the one devoted to framing effect and decision theory. It has had a great impact on work on risk perception cognitive bias in financial behavior, providing a conceptual framework within which later work on behavioral economics is developed.

2) Recent And Mid-Decade Publications with Notable Impact:

a) Pompian, M. M. (2012) – 1,649 citations

The book brings together theory and practice through inclusion of investor biases on portfolio strategies. With its pragmatic focus, it tends to have the most impact on those that are wealth managers or practitioners of behavioral investment.

b) Ajzen, I. (1991) – 647 citations

The Theory of Planned Behavior though not of particular interest to the field of finance has gradually gained prominence in financial decision model. It has improved a great deal on the interdisciplinary domains between psychology and investment behavior.

c) Panno, A., Donati, M. A., Milioni, M., & Chiesi, F. (2020) – 621 citations

The present study indicates this supportive emerging scholarly research on subjective financial choice research. It brings in elements of psychology in the analysis of investment behavior particularly the risk perception and has gained quick acceptance.

d) Bhatt, K., & Bhatt, S. (2018) – 584 citations

Being dedicated to subjective risk perceptions of investing in stocks on the stock market, the paper is outstanding in its empirical contribution to the study of investor psychology, primarily in the retail setting.

3) Moderately Cited But Regionally And Demographically Relevant Studies:

a) Abeysekera, I. (2019) – 221 citations

The article examines the impact of information asymmetry on investment strategy, underscored by the behavioral and informational dualism of financial choices. Its significance is increasing, particularly in the emerging markets.

b) Statman, M. (2019) – 175 citations

The book presents second-generation behavioral finance, broadening classical theory to encompass emotion and social factors. Despite being fairly moderately cited, it sets the stage for more integrated investor behavior models.

c) Chavali, K., & Mohanraj, M. (2018) – 79 citations

Examines demographic drivers of risk tolerance in the Indian market. Although not very well cited, offers relevant information on regional and demographic drivers of investor attitudes and fills a void in Indian market literature.

4) Under-Cited Yet Thematically Important Studies:

a) Baker, H. K., Ricciardi, V., & Nofsinger, J. R. (2019) – 69 citations

Despite its low citation count, this paper covers core behavioral biases affecting investors. Its thematic relevance to investor education and bias awareness makes it significant in applied behavioral finance.

b) Merle, R., Watson, K., & Schiller, P. (2022) and Kim, K. A., & Nofsinger, J. R. (2020) – 56 citations

These recent studies delve into framing effects and disposition bias, respectively. Their emerging nature may explain the lower citation count, yet both contribute to nuanced understanding of investment decisions in behavioral contexts.

c) Baker, H. K., Filbeck, G., & Nofsinger, J. R. (2019) – 37 citations

Though under-cited, this work provides an accessible overview of behavioral finance for a general audience. Its educational value supports investor literacy and broader dissemination of behavioral concepts.

d) Slovic, P., & Peters, E. (2020) – 21 citations

Focuses on the psychometric paradigm of risk perception. While under-recognized, it offers a theoretical lens for understanding how individuals perceive and evaluate financial risks cognitively and emotionally.

e) Bouslama, G., Melis, G., & Melis, B. (2020) – 15 citations

This paper studies the framing of investment decisions—a topic central to behavioral finance. Although citation numbers are low, its theoretical alignment with established framing theory gives it potential for future influence.

Research Gap

After having the Citation analysis we found a clear research gap exists in exploring how behavioural biases and risk perception impact investment decisions, specifically within Kolkata's financial community. While prior studies have examined these factors in various regions, there is limited data on how the unique economic and cultural context of Kolkata shapes these investment behaviours. This study addresses this gap by applying confirmatory factor analysis to validate constructs like risk perception, framing effects, and information asymmetry. By focusing on Kolkata, the research aims to contextualize behavioural finance theories regionally, providing insights valuable to both academia and local financial advisement practices.

Objectives:

1. **To evaluate the impact demographic profile of investors' on investment decision-making factors.**
2. **To assess the reliability and validity of measurement items for each construct.**
3. **To determine the influence of behavioural biases on risk-related financial decisions.**
4. To explore the psychological factors influencing investment behaviour using Exploratory Factor Analysis.

Research Methodology:

Methodology Overview:

This study used a mixed-methods approach, combining quantitative and qualitative research techniques to examine the psychological factors influencing investment decision-making. Random sampling was

employed to select households for interviews, and data were collected using structured questionnaires distributed both physically and through Google Forms to maximize participation.

The study integrated ethnographic methods, grounded theory approaches, and focus group discussions to account for the dynamic socio-economic factors influencing respondents (Bouslama et al., 2020). The methodology was designed to provide a thorough understanding of how psychological and demographic factors shape investment behaviours (Lim et al., 2022).

Nature of Data

Primary data was collected using a structured questionnaire containing both closed and open-ended questions. The survey featured demographic questions followed by dichotomous, multiple-choice items, and 5-point Likert scale items. Open-ended questions allowed respondents to offer additional feedback, providing deeper insights into their investment attitudes and behaviours (Slovic & Peters, 2020).

Period of Data Collection

The data collection process spanned three months, from August to October 2024, during which 521 responses were gathered. The collected data were analyzed to identify patterns in investment behaviours and the psychological factors influencing these decisions (Raja et al., 2019).

Questionnaire Development and Measurement

The questionnaire focused on two main areas: demographic factors and psychological influences on investment decisions. Demographic factors were assessed through five attributes, while 27 items were designed to measure various psychological factors. A 5-point Likert scale was used, with responses ranging from "Strongly Agree" (1) to "Strongly Disagree" (5), based on Ajzen's Theory of Planned Behaviour (Ajzen, 1991) to capture respondents' investment attitudes (Panno et al., 2020).

Sample Analysis

The study involved 521 respondents, selected to ensure a diverse range of demographic backgrounds, providing a comprehensive understanding of the factors influencing investment decisions in the target population (Kim & Nofsinger, 2020).

Tools for Analysis:

The empirical data were analyzed in three key sections:

1. **Residential Profile Analysis:** Demographic information, including age, gender, marital status, etc., was analyzed using frequency distribution tables and descriptive statistics (Abeysekera, I., 2019), Kim & Nofsinger, 2020).

2. **Investment Pattern Analysis:** This section examined respondents' investment habits, such as types of investments and duration of activity, analyzed with frequency distributions using Microsoft Excel and SPSS 21 (Lim et al., 2022).

3. **Psychological Factors Analysis:** This critical section focuses on the psychological influences on investment behaviour. Exploratory Factor Analysis (EFA), using Principal Component Analysis with Varimax Rotation, was applied to uncover latent psychological factors (Bouslama et al., 2020, Chavali, K., & Mohanraj, M., 2018).

Extensive Description of the Data Collected:

The following data was obtained from a total of 521 respondents using both physical and Google forms:

Table -2: Extensive Description of the Data Collected

Study Area	No. of Responses Received	Remarks
Investors' of Kolkata	521	Physical Forms & Google Forms

Data Screening Process:

The variables were systematically entered into the "Variables View" in SPSS 25, ensuring proper labeling, naming, and scaling. After data collection via a structured questionnaire, responses were inputted into the "Data View."

Step 1: Accuracy Check: The data file, named "Amit (521).sav," was rigorously verified for accuracy by a separate individual following the 'maker and checker' principle. Errors identified were corrected during this process.

Step 2: Reliability Test: A reliability test using Cronbach's Alpha was performed in SPSS 21, yielding a value of 0.877 for standardized items (shown in Table 1), signifying high internal consistency. According to Guilford (1965), values above 0.7 indicate strong reliability, affirming the questionnaire's consistency.

Table-3: Reliability Statistics

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.196	.877	89

(Source: Calculated through SPSS 21)

Step 3: Validity Test: The subsequent step involved assessing validity, ensuring the questionnaire accurately measured the intended constructs.

Table-4: ANOVA with Tukey's Test for Nonadditivity

ANOVA with Tukey's Test for Nonadditivity						
		Sum of Squares	df	Mean Square	F	Sig.
Between People		12833.453	520	24.680		
Within People	Between Items	935699.062	88	10632.944	536.150	.000
	Nonadditivity ^a	151630.127	1	151630.127	9179.241	.000
	Residual	755884.159	45759	16.519		
	Total	907514.286	45760	19.832		
Total		1843213.348	45848	40.203		
Grand Mean = 3.6502		1856046.801	46368	40.029		

a. Tukey's estimate of power to which observations must be raised to achieve additivity = -1.793.

(Source: Calculated through SPSS 21)

Table 2 indicates that Tukey's test for non-additivity is statistically significant, confirming that the dataset contains no fabricated or inconsistent values.

Table-5: Hotelling's T-Squared Test

Hotelling's T-Squared Test				
Hotelling's T-Squared	F	df1	df2	Sig.
.000 ^a	.	.	.	.

a. Hotelling's T-Squared cannot be computed because of a singular covariance matrix.

(Source: Calculated through SPSS 21)

After this Hotelling's T-Squared Test for interclass correlation coefficient was also found. (Shown in Table-3).

Following the Tukey's One Degree of Freedom Test and Hotelling's T-Squared Test, the intraclass correlation coefficient was computed, as detailed below.

Table-6: Intraclass Correlation Coefficient

Intraclass Correlation Coefficient							
	Intraclass Correlation ^b	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig.
Single Measures	.003 ^a	.001	.005	1.244	520	45760	.000
Average Measures	.196 ^c	.095	.292	1.244	520	45760	.000

Two-way mixed effects model where people effects are random and measures effects are fixed.

a. The estimator is the same, whether the interaction effect is present or not.

b. Type C intraclass correlation coefficients using a consistency definition-the between-measure variance is excluded from the denominator variance.

c. This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.

(Source: Calculated through SPSS 21)

Table - 4 indicates that the null hypothesis cannot be rejected since the p-value $> \alpha$ (or $F < F_{crit}$). This suggests no significant difference exists between the mean vectors of the simple and average measures.

Step 4: Test for Normality using the One-Sample Kolmogorov-Smirnov Test

The result of the Kolmogorov-Smirnov test was found to be 0.000, indicating significance. This confirms that despite the use of convenience sampling, the dataset aligns with a normal distribution.

Empirical Data Analysis and Findings**Section A: Analysis of Respondents' Residential Profile Analysis (Tversky, A., & Kahneman, D., 1992):**

1. **Age of Respondents:** The majority (56.8%) of respondents belong to the age group of 30 to 60 years, indicating a preference for risk-taking strategies among middle-aged investors.
2. **Gender:** Approximately 68.3% of respondents are male, showing higher behavioural readiness to invest compared to their female counterparts (31.7%).
3. **Religion:** The survey reveals that 74.6% of respondents identify as Hindu, demonstrating higher investment readiness than those of other religious groups.
4. **Caste:** Most respondents (62.4%) belong to the General caste category.
5. **Marital Status:** Married respondents (71.2%) show greater investment levels compared to unmarried individuals, likely due to financial planning responsibilities.
6. **Home Town:** All respondents (100%) reside in Kolkata and surrounding areas, aligning with the study's geographic focus.
7. **Educational Qualification:** A significant portion (64.7%) of respondents hold higher educational qualifications, ensuring the reliability of conclusions drawn.
8. **Occupation:** Among the respondents, 55.3% are employed in the private sector, 22.1% are self-employed, and 7.8% work in the government sector.
9. **Annual Income:** About 38.2% of respondents report an annual income exceeding ₹3 lakhs, providing sufficient investible funds.
10. **Family Size:** Most respondents (76.4%) have families with 3 to 5 members, resulting in moderate savings available for investment.
11. **Earning Members:** More than half (63.2%) have multiple earning members in the family, enabling higher potential for savings and investments.
12. **Dependent Members:** Around 91.3% of respondents have fewer than three dependents, reducing financial constraints and encouraging investments.
13. **Family Income:** A substantial 43.1% of respondents belong to families with annual incomes ranging between ₹4 lakhs and ₹5.99 lakhs, facilitating reasonable investment opportunities.

Section B: Analysis of Investment Pattern Analysis:

14. **Savings Importance:** Nearly 72% of respondents believe that saving is crucial for financial security.
15. **Investment Awareness:** A significant number of respondents are committed to securing their future by actively investing.
16. **Investment Pattern:** Respondents prefer long-term investments over short-term financial gains, emphasizing financial stability.
17. **Preferred Investment Instruments:** Most respondents prioritize capital market instruments, reflecting growing interest in equity markets in Kolkata.
18. **Investment Tenure:** Approximately 35.1% of respondents have been investing for less than 5 years, indicating an inclination toward long-term investment strategies.
19. **Investment Frequency:** The majority (68.7%) invest monthly, while 9.2% prefer quarterly and 6.1% annually. Daily, weekly, or spare-time investments were negligible.
20. **Preferred Investment Avenues:** Besides equities, respondents favor high-return, liquid investment options, prioritizing flexibility and returns over portfolio maximization.

Section-C: Exploratory Factor Analysis of Psychological Factors:**Exploratory Factor Analysis (EFA):**

Table-7: KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.751
+Bartlett's Test of Sphericity	Approx. Chi-Square	18,452.731
	df	512
	Sig.	.000

(Source: Calculated through SPSS 21)

As per Table 5 the KMO and Bartlett's Test results indicate the suitability of the data for factor analysis. The Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy is **0.751**, considered acceptable (values above 0.7 are generally deemed good), suggesting that the sample size is adequate for conducting factor analysis. Bartlett's Test of Sphericity shows a Chi-Square value of 18,452.731 with 512 degrees of freedom, and the significance level (Sig.) is 0.000. This indicates that the correlation matrix is not an identity matrix, meaning the data is suitable for factor analysis.

Principal Component Analysis for Exploratory Factor Analysis

Table 6 summarizes the results of a Principal Component Analysis (PCA) conducted on a dataset, showing the variance distribution across different components. 39 components were extracted, with the first four explaining 55.962% of the variance, and the first three contributing significantly with 49.945% of the cumulative variance. Following the rotation, the first three components explain 49.192% of the variance. The analysis indicates that the data was reduced into a manageable number of exploratory factors, with 4 components representing the most significant variance, and the remaining components contributing marginally.

Table-8: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	11.300	28.974	28.974	11.300	28.974	28.974	8.326	21.350	21.350
2	5.226	13.400	42.374	5.226	13.400	42.374	5.930	15.205	36.555
3	2.953	7.571	49.945	2.953	7.571	49.945	4.928	12.637	49.192
4	2.347	6.017	55.962	2.347	6.017	55.962	2.640	6.770	55.962
5	2.001	5.132	61.094						
6	1.604	4.114	65.208						
7	1.526	3.913	69.121						
8	1.356	3.478	72.599						
9	1.143	2.930	75.529						
10	1.116	2.862	78.391						
11	.984	2.524	80.915						
12	.884	2.267	83.182						
13	.797	2.045	85.227						
14	.770	1.974	87.201						
15	.623	1.597	88.798						
16	.599	1.536	90.334						
17	.478	1.227	91.561						
18	.432	1.108	92.668						
19	.411	1.053	93.721						
20	.351	.900	94.621						
21	.322	.825	95.447						
22	.229	.587	96.034						
23	.206	.529	96.563						
24	.204	.522	97.085						
25	.187	.480	97.565						
26	.177	.455	98.020						
27	.139	.355	98.375						
28	.125	.321	98.696						
29	.109	.279	98.975						
30	.091	.234	99.209						
31	.075	.192	99.401						
32	.067	.171	99.572						
33	.045	.116	99.687						
34	.032	.082	99.769						
35	.031	.078	99.848						
36	.025	.065	99.913						
37	.015	.039	99.952						
38	.011	.028	99.980						
39	.008	.020	100.000						

Extraction Method: Principal Component Analysis.

(Source: Calculated through SPSS 21)

Table-9: Rotated Component Matrix

Rotated Component Matrix^a				
	Component			
	1	2	3	4
X63. I am intrigued by the patterns I find in art and nature.	.867			
X66. I have a lot of intellectual curiosity.	.864			
X71. I generally try to be thoughtful and considerate.	.767			
X59. I really enjoy talking to people.	.765			
X61. I am a cheerful, high-spirited person.	.725			
X62. I am a very active person.	.716			
X67. I often enjoy playing with theories or abstract ideas.	.715			

+

X73. I'm pretty good about pacing myself so as to get things done on time.	.656			
X78. I prefer a low risk/high return investment with a steady performance over an investment that offers higher risk/higher return.	.603			
X60. I often feel as if I'm bursting with energy.	.582			
X64. I often try new and foreign foods.	.572			
X72. I keep my belongings neat and clean.	.552			
X70. Some people think of me as cold and calculating.				
X65. I have little interest in speculating on the nature of the universe or the human				
X80. I view risk in investment as a situation to be avoided at all cost.				
X77. I am not willing to take risk when choosing a stock or investment.				
X57. Sometimes I feel completely worthless.		.767		
X74. I waste a lot of time before settling down to work.		.752		
X76. I never seem to be able to get organized.		.738		
X54. I often feel inferior to others.		.703		
X55. When I'm under a great deal of stress, sometimes I feel like I'm going to pieces.		.680		
X68. I often get into arguments with my family and co-workers.		.621		
X75. Sometimes I'm not as dependable or reliable as I should be.		.593		
X58. Too often, when things go wrong, I get discouraged and feel like giving up.				
X79. I prefer to remain with an investment strategy that has known problems rather than take the risk trying a new investment strategy that has unknown problems, even if the new investment strategy has great returns.				
X56. I often feel tense and jittery.				
X85. I intend to compare my portfolio performance to that of professional managers.			.769	
X88. I intend to take an investments course.			.749	
X87. I intend to have a portfolio that focuses on multiple asset classes (i.e., stocks, bonds, cash, real estate, etc.)			.742	
X84. I intend to perform my own investment research instead of using outside advice.			.714	
X86. I intend to save at least 10% of my gross earnings for investing/saving/retirement purposes.			.675	
X81. I intend to invest in an IRA every year.			.608	
X90. I intend to invest some money in long-term assets where my money will be tied up and inaccessible for years.			.588	
X83. I intend to engage in portfolio management activities at least twice per week.				

X89. I intend to manage my portfolio for maximum gross return rather than tax and cost efficiency.				
X52. Generally speaking, would you agree that most people can be trusted:				.661
X53. Generally speaking, you always have to be careful in dealing with people other than your family:				.564
X69. Some people think I'm selfish and egotistical.				
X82. I intend to put at least half of my investment money into the stock market.				
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.				
a. Rotation converged in 6 iterations.				
(Source: Calculated through SPSS 21)				

Table 7 shown the Interpretation of the Factors as per Exploratory Factor Analysis:

a) Factor 1:

The first factor, "**Mental Accounting**," includes variables like X63 (0.867), X66 (0.864), X71 (0.767), and X59 (0.765), X61(0.725), X62(0.716), X67(0.715), X73(0.656), X78(0.603), X60(0.582), X64(0.572) and X72(0.552) which reflect a tendency to compartmentalize experiences, focusing on specific patterns and categories. The regression equation for this factor is:

$$\beta_1 = 0.867X_{63} + 0.864X_{66} + 0.767X_{71} + 0.765X_{59} + 0.725 X_{61} + 0.716X_{62} + 0.715X_{67} + 0.656X_{73} + 0.603X_{78} + 0.582X_{60} + 0.572X_{64} + 0.552X_{72}.$$

b) Factor 2:

The second factor, "**Cognitive Bias**," is represented by variables such as X57 (0.767), X74 (0.752), X76 (0.738), X54 (0.703), X55(0.680), X68(0.621) and X75(0.593) showing the impact of personal biases in decision-making, including overconfidence and flawed judgments. The regression equation for this factor is:

$$\beta_2 = 0.767X_{57} + 0.752X_{74} + 0.738X_{76} + 0.703X_{54} + 0.680X_{55} + 0.621X_{68} + 0.593X_{75}.$$

c) Factor 3:

The third factor, "**Loss Aversion**," includes variables X85 (0.769), X88 (0.749), X87 (0.742), X84 (0.714), X86(0.675), X81(0.608), and X90(0.588) indicating a heightened sensitivity to potential losses over gains in decision-making Merle, (R., Watson, K., & Schiller, P. ,2022). The regression equation for this factor is:

$$\beta_3 = 0.769X_{85} + 0.749X_{88} + 0.742X_{87} + 0.714X_{84} + 0.675X_{86} + 0.608X_{81} + 0.588X_{90}.$$

d) Factor 4:

The fourth factor, "**Conservatism Bias**," is represented by variables X52 (0.661) and X53 (0.564), suggesting a preference for familiar investment strategies and a reluctance to embrace new or risky approaches (Guilford, J. P.,1965). The regression equation for this factor is:

$$\beta_4 = 0.661X_{52} + 0.564X_{53}.$$

Thus, the final model explaining investment decision-making is influenced by the factors: "Mental Accounting," "Cognitive Bias," "Loss Aversion," and "Conservatism Bias." The complete regression model is:

$$D_{pii} = \beta_1 + \beta_2 + \beta_3 + \beta_4.$$

Conclusion

This study provides a detailed exploration of the psychological underpinnings that shape investment decisions. The research emphasizes that investment behaviour is profoundly influenced by cognitive biases (such as mental accounting and overconfidence) and emotional biases (including loss aversion and conservatism). These biases, analysed through exploratory factor analysis, highlight the latent psychological factors driving decision-making in the financial community of Kolkata.

By investigating how these biases interplay with demographic and socio-economic variables, the study bridges a critical gap in behavioural finance literature. It showcases how psychological influences, rooted in

subjective risk perception and individual experiences, diverge from traditional finance's rational assumptions.

The insights gained not only validate the relevance of behavioural finance frameworks like Prospect Theory but also provide actionable recommendations for financial advisors. Understanding the psychological tendencies of investors, as identified in this study, can enable tailored financial strategies, ensuring better alignment with individual risk profiles and investment goals.

This work advances the academic discourse on cognitive and emotional biases while equipping practitioners with a localized understanding of investment behaviour.

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Happiness among Knowledge Workers

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Keywords

Happiness, Knowledge workers, Subjective well-being, Software development organisation.

Abstract

Purpose of the research: This research aims to determine the level of happiness among knowledge workers within a South African software development organisation. Knowledge workers are defined as workers who have high degrees of expertise, education and experience, which they use to acquire, create, share and apply their knowledge in the workplace.

Design/methodology: The research methodology is quantitative, with the primary data gathered via an Internet-based self-completion questionnaire.

Results/findings: This study established that the independent factors of Company pride, Workplace influence, Leisure, Work relationships, Job satisfaction and Work-life balance all exerted a significant positive effect on knowledge workers' happiness. The notion of happiness in the workplace is important, due to its potential to maximise employee performance and stimulate numerous benefits for both the employer organisation and the worker.

Practical implications and Conclusions: Promoting knowledge worker happiness within a software development organisation facilitates tangible benefits, such as enhanced development productivity, superior product quality, improved creativity/analytical thinking and improved company financial performance and employee retention.

Introduction

Knowledge workers are differentiated from manual workers because they think for a living and do not do manual tasks (CFI, nd). Peter Drucker (1959) defined knowledge workers as high-level workers who apply theoretical and analytical knowledge and noted that they would be the most valuable assets of a 21st-century organisation. Organisations depend on the value created by knowledge workers (Óskarsdóttir et al., 2022). Job titles that have emerged from the information age, such as computer programmers, software developers and Information Technology (IT) consultants are classified as knowledge workers (IBM Education, 2023). One of the challenges relating to knowledge workers is retention and it is therefore imperative that they are happy at work. Empowering them to stay productive is a challenge (IBM Education, 2023; Matson and Prusak, 2010). Software professionals are employees who work intensively in developing new IT products by using and adopting existing technologies (Fung, Hui and Yau, 2021).

Óskarsdóttir et al.'s (2022) systematic literature review on knowledge worker productivity revealed seventy-eight papers that touched on the following concepts: organisational commitment and engagement, communication and relationships, personal characteristics and development, personal knowledge management, well-being or happiness and job satisfaction and task approach. This study focused on the happiness of knowledge workers in a software development organisation in South Africa. Shelke and Shaike (2023) commented in their study on the role of workplace happiness of IT knowledge workers in India, that empirical studies on workplace happiness are still at dearth as several studies are commonly related to only job satisfaction and most studies do not clearly show how workplace happiness influences employee engagement levels. Mochón (2018) states that happiness can be measured despite the field being dominated by non-scientific traditions for many years.

The problem addressed in this study is that the factors that influence knowledge worker happiness in a software development organisation have not been established nor adequately explored. The research objective of this study was to determine the factors that influence knowledge worker happiness in a software development organisation.

Literature Review

Happiness and the pursuit thereof are preeminent throughout human culture. It is reflected in Art, in History, in Philosophy, in Literature and in Architecture. Importantly, the pursuit of happiness is one of the self-evident truths introduced within the American Declaration of Independence in 1776 (Robertson, 2016). The consideration of happiness and the search for 'the good life' are concepts that date back to humanity's earliest recorded history (Peterson, Park and Seligman, 2005). The benefits of happiness at work at the organisational level are manifold and can have a significant impact on the overall success of the organisation (Saritha and Mukherjee, 2024).

Happiness is a combination of hedonic (pleasure versus displeasure) and stimulation (active versus inactive) values (Graziotin et al., 2018). The 20th century saw a raised awareness of the beneficial elements of employee health and well-being or happiness. Pryce-Jones and Lindsay (2014, p. 131) define happiness at work as the "...mindset, which enables action to maximise performance and achieve potential". For most individuals, the activity of work consumes approximately half their lifetime, significantly influencing their lifestyles and contributing to their personal development (Mahadea and Ramroop, 2014). For this reason, the improvement of work-based happiness is a valued objective for organisations (Mahadea and Ramroop, 2014). Charles-Leija et al. (2023) note the value of the "happy-productive worker hypothesis", which presents the notion that happier workers exhibit greater levels of productivity.

Seligman (2011) proposed the concept of flourishing, which he based on his work in happiness, stating that it is the golden standard for well-being or happiness. His PERMA model outlines five core elements of wellbeing or happiness, which include positive emotions, engagement, relationships, meaning and accomplishment (Seligman, 2011). Happiness refers to the experience of positive emotions combined with much deeper feelings, including purpose and meaning (Achor, 2014). In the work environment, happiness is relative to individual employees and how they feel about their jobs and their lives (Achor, 2014).

Research indicates that employees possessing an elevated degree of happiness tend to display desirable workplace qualities, such as increased productivity, enhanced workplace collaboration, greater earning potential, favourable workplace evaluations, improved social relationships and a greater sense of workplace community (Cullen and Calitz, 2018). Happiness leads to desirable outcomes in education, work performance and productivity, improved health and longevity and it promotes fulfilling social relationships (Graziotin et al., 2018).

Determinants of Happiness

De Neve and Ward (2017) propose that the factors which drive happiness include work-life balance, autonomy, variety, job security, social capital, health and safety. Cullen and Calitz (2018) further note that factors like workplace influence, workplace/social relationships, optimism, job satisfaction and employee value proposition all exhibit statistical and practical significance to employee happiness. Understanding what matters most to employees can create a competitive advantage (Holtom et al., 2020). The following factors were operationalised from the literature for this study.

Company pride

Company pride benefits organisations as commitment is increased and employee turnover costs are decreased (Pereira et al., 2021). Pride is an important source of motivation for both individuals who experience it and those who express it in organisations (Wu, Brosi and Shaw, 2023). The concept of pride is a complex, self-conscious, non-verbal, unique yet easily recognisable human emotion, which is naturally exhibited because of feeling satisfied through one's personal or work-based accomplishments, competencies or positive appraisals (Masterson, Liden and Kluemper, 2017). Pride results from goal attainment, task completion or skill mastery and reflects satisfaction with one's achievement and identity, particularly within

a team or group-based social interactions (Schilpzand et al., 2025). For employees to demonstrate workplace pride, their work must be meaningful and make a positive contribution to the company (Taylor, 2019).

Workplace influence

Knight (2018) suggests that influence at work can be stimulated by networking, listening to colleagues, strategising successful outcomes, addressing stakeholders' needs and providing clear benefits to the overall organisation. Employees are empowered and encouraged to pursue healthier behaviours when they have the freedom to make decisions and are permitted to participate and discuss their ideas (Hsu et al., 2019). Influence at work is one of the most important factors in psychosocial working conditions as employees find it important to influence their core tasks (Andersen et al., 2022).

Leisure

Leisure demonstrates benefits, such as improved overall health and well-being, greater happiness, enhanced life satisfaction and self-esteem, stimulates greater life purpose, personal growth, better relaxation, stress relief, improved mood, physical fitness, better time management, greater longevity, improved cognitive functioning, greater cultural harmony and social support, interaction and integration (Wang and Sunny Wong, 2014). Leisure enhances individual well-being and improves the overall quality of life. Leisure investment in the workplace positively affects organisational commitment (Kao, 2024).

Optimism

Optimistic workers are desirable for a host of reasons, such as increased self-confidence, enhanced task performance and the ability to maintain higher levels of happiness when encountering stressful tasks or activities (Seligman, 2002). Optimists display greater physical health, receive greater earnings and experience positive social interactions with their co-workers (Walsh et al., 2018). Optimists are more productive, creative, motivated and are generally happier in life and they are more flexible workers with a greater capacity for problem-solving (Sahai and Singh, 2017).

Purpose

For workers, purpose at work (sometimes referred to as meaningful work) represents the means through which they can attain a degree of personal fulfilment (Schuyler and Brennan, 2016). Meaningful work may be expressed as the significance of work-based goals in relation to one's own goals. (Grama and Ramona, 2017). Purpose at work helps to guide workers' efforts, especially when directed at making a difference in the lives of colleagues, customers and the community (Rey et al., 2019). Meaningful work is associated with positive mental well-being and is associated with the ideas of 'good work' and 'job pride', which are important aspects of fulfilling experiences (Seligman, 2002).

Work relationships

People possess an intrinsic need to belong to a community (Saphire-Bernstein and Taylor, 2013). The cultivation of meaningful social relationships is achieved through shared experiences where the interaction is fun, productive or authentic (Leslie, Aaker and Schiffrin, 2012). Social relationships refer to a person possessing friends, family, work colleagues and being actively engaged within their local community (Saphire-Bernstein and Taylor, 2013). Understanding the impact of relationships in the workplace is crucial for organisations that want to create a positive work environment and enhance employee engagement and productivity. The workplace is a social ecosystem where interpersonal connections and interactions shape the work experience (Majini Jes Bella, 2023).

Job satisfaction

Work is an important component of optimal human functioning and if designed correctly, a source of subjective well-being (Gavin and Mason, 2004; Haworth and Veal, 2004). In addition, workplace happiness influences the level of productivity within organisations (Shelke and Shaihk, 2023). Consequently, it is important to understand the workplace's role and its effect on employee happiness (De Neve and Ward, 2017). Improving workplace happiness is a worthy objective as employed people favourably evaluate the quality of their lives (De Neve and Ward, 2017). Happier workers are associated with greater workplace

success, higher job engagement, better job satisfaction, superior workplace performance and productivity (Davis, 2017).

Job satisfaction describes a person's general work attitude, degree of career fulfilment and motivation towards their job (Krekel, Ward and de Neve, 2019). More specifically, job satisfaction may be defined as a pleasurable emotional condition, which emerges due to a worker's job and/or their work experiences (Yusuf, 2018). Job satisfaction improves employee productivity and client service quality, thereby enhancing customer satisfaction and driving the organisation towards greater profitability (Rey et al., 2019). Improved job satisfaction increases employee satisfaction, raises productivity, increases favourable attitudes towards work, raises employee engagement, promotes organisational citizenship, develops co-worker relations, grows staff morale, supports conflict resolution, enhances problem-solving, raises motivation, improves workplace mood, increases earnings potential, reduces work avoidance behaviour, lowers staff turnover and decreases absenteeism (Krekel, Ward and de Neve, 2019). Organisations with a high level of job satisfaction tend to have higher profitability and productivity and reduced knowledge worker turnover (Todericiu, Grama and Beca, 2023).

Work-life balance (WLB)

Work-life balance has emerged as a modern-day challenge as the quality of home/community life deteriorates because of life and work stresses (Campbell, 2018). Consequently, work-life balance has emerged as an influential predictor of an individual's subjective well-being in the workplace (De Neve and Ward, 2017). Workplace commitments consume much of an adult's time and effort, requiring the careful balancing of work and life/family responsibilities (Thilagavathy and Geetha, 2023). A person performs numerous roles during daily life, such as family member, employee, coach, volunteer, etc. Each role is complex, typically fulfilling a portion of an individual's needs and goals (Slocum and Hellriegel, 2011). Knowledge workers have high work flexibility through outsourcing and off-site client work, which leads to relatively more overlap between work and non-work life and they often suffer severely from prolonged working hours (Fung, Hui and Yay, 2021).

Hypotheses

The following hypotheses were tested in this study:

- H₁: Company pride exerts a positive effect on the happiness of knowledge workers
- H₂: Workplace influence exerts a positive effect on the happiness of knowledge workers
- H₃: Leisure exerts a positive effect on the happiness of knowledge workers
- H₄: Optimism exerts a positive effect on the happiness of knowledge workers
- H₅: Purpose exerts a positive effect on the happiness of knowledge workers
- H₆: Work relationships exert a positive effect on the happiness of knowledge workers
- H₇: Job satisfaction exerts a positive effect on the happiness of knowledge workers
- H₈: Work-life balance exerts a positive effect on the happiness of knowledge workers

Research Methodology

The research study had a descriptive and analytical design, which is classified as applied research. The research philosophy was positivistic and the research approach was deductive. The research methodology was quantitative, with the primary data gathered via an Internet-based self-completion survey. The survey instrument was a standardised questionnaire, which was operationalised from literature and previous studies on the happiness of professionals (Calitz, Cullen and Midgley, 2022). The population consisted of knowledge workers employed at a software development organisation in South Africa. The response rate was 89%, 116 responses out of a population of 130 staff members. The statistical analyses included inferential statistics and Exploratory Factor Analysis (EFA). The Nelson Mandela University Ethics Committee gave ethical clearance for the study.

Results

The demographics of the sample are presented in Figure 1. Most of the respondents were male (86%), which aligns with national figures of 21% females employed in the IT industry in South Africa (IITPSA, 2025). Most respondents were under 36 (75%) and had worked for less than 6 years in the IT industry. Sixty-

eight percent (n=79) had a degree or a post-graduate degree and 98% lived in Port Elizabeth, South Africa. Thirty-nine percent (n = 45) are employed as software developers, followed by fifteen percent (n = 17) of the respondents employed within the manufacturing PLC department. The remaining 46% of respondents (n = 54) are split across different departments, including systems analysis and design, software testing, quality assurance and IT project Management.

Figure 1. Demographics

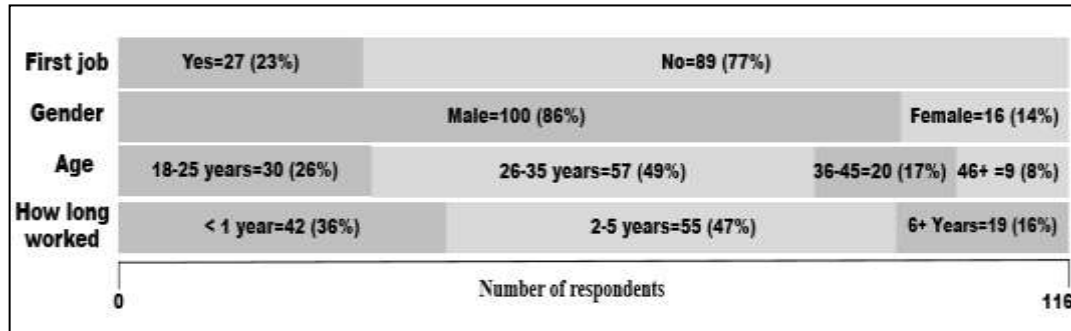


Table 1 indicates the six remaining factors, after the exploratory factor analysis was conducted, with selected items being included for each factor. The Cronbach's alphas were all above 0.80, indicating Good (0.80-0.89) or Excellent (0.90+) reliability. The factor loading and percentage of total variance explained for each factor are also included in Table 1.

Item	Factor	Eigen Values	% Total Variance Explained	Cronbach's α
IF1: Company Pride		3.812	54.5	0.86
I am proud to work here	0.782			
This company has symbols I identify with	0.763			
This is a good organisation to work for	0.757			
The company has a great culture	0.681			
IF2: Workplace influence		3.794	63.2	0.88
I have influence over decisions that affect my work	0.836			
My effort to take initiative is recognised	0.801			
I have influence over my work environment	0.797			
I have influence over how I do my tasks	0.749			
IF3: Leisure		4.342	72.4	0.91
Leisure activities relieve stress	0.904			
Leisure activities help me stay healthy	0.902			
Leisure activities are important to me	0.829			
Leisure activities enhance my relationships	0.636			
IF4: Work relationships		4.437	55.5	0.88
I like the people I work with	0.839			
I have good friends at work	0.810			
It is easy for me to ask for help	0.788			
The business has a real interest in my welfare	0.787			
IF5: Job satisfaction		5.419	54.2	0.90
I am happy at work	0.811			
I am motivated to do my best	0.745			
I can learn new skills at work	0.739			
I feel respected at work	0.523			
IF6: Work-life balance		3.480	58	0.85
My life is balanced	0.806			
I am satisfied with my life	0.798			
I have attained the most important things I want in life	0.757			

The conditions of my life are excellent	0.746			
In most ways, my life is close to ideal	0.662			
DF Happiness		4.764	68.1	0.92
I am happy	0.860			
I consider myself a happy person	0.854			
I am generally happy and enjoy life	0.848			
Life is good	0.836			

Table 1. Factors and selected items after EFA

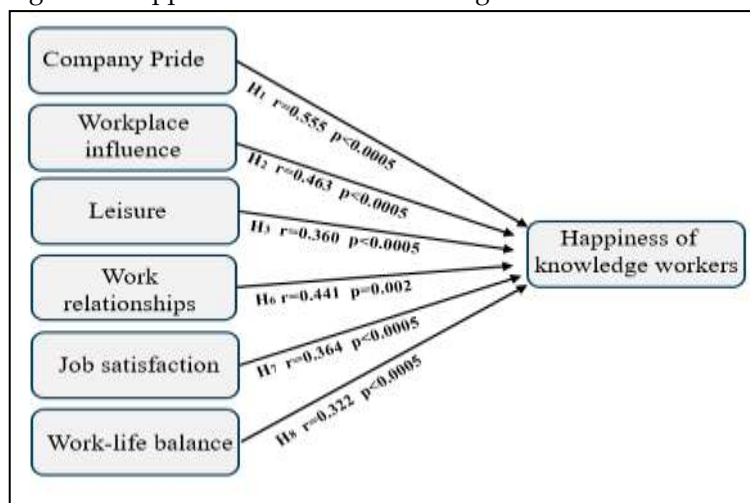
Table 2 illustrates the Pearson correlations and p-values for the hypotheses. The correlations are statistically significant at the 0.05 level for $n=116$ if $|r| \geq 0.182$ and are practically significant if $|r| \geq 0.300$, thus both practically and statistically significant if $|r| \geq 0.300$. All correlations were statistically and practically significant, as indicated by Cohen's d . Six hypotheses were accepted, as the p-values were less than 0.0005 and the correlations greater than 0.300, as indicated in Table 2.

Factor	Mean	Std. Dev.	r-value	p-value	Cohen's d	Accept/Reject
H ₁ : Company pride exerts a positive effect on the happiness of knowledge workers	3.85	0.64	0.555	<0.0005	0.71 Medium	Accept
H ₂ : Workplace influence exerts a positive effect on the happiness of knowledge workers	4.05	0.70	0.463	<0.0005	0.93 Large	Accept
H ₃ : Leisure exerts a positive effect on the happiness of knowledge workers	4.17	0.65	0.360	<0.0005	1.19 Large	Accept
H ₄ : Optimism exerts a positive effect on the happiness of knowledge workers	3.43	0.71	0.367	0.641	n/a	Reject
H ₅ : Purpose exerts a positive effect on the happiness of knowledge workers	3.46	0.71	0.489	0.371	n/a	Reject
H ₆ : Work relationships exert a positive effect on the happiness of knowledge workers	3.99	0.57	0.441	0.002	0.30 Small	Accept
H ₇ : Job satisfaction exerts a positive effect on the happiness of knowledge workers	3.76	0.69	0.364	<0.0005	0.52 Medium	Accept
H ₈ : Work-life balance exerts a positive effect on the happiness of knowledge workers	3.99	0.64	0.322	<0.0005	1.03 Large	Accept

Table 2. Hypotheses and statistics

Figure 2 illustrates the six independent factors with the six accepted hypotheses from Table 2 and their relationship to the dependent factor, happiness of knowledge workers.

Figure 2. Happiness model for knowledge workers after EFA



Discussion and Conclusions

The statistically relevant independent factors, which influence employee happiness are Company pride, Workplace influence, Leisure, Work relationships, Job satisfaction and Work-life balance as indicated in Figure 2. Based on the statistical analysis, each of these factors exhibits a significant and positive effect on employee happiness at the software organisation under review. A notable independent factor is that of Company pride, which possessed the highest correlation with Happiness, with a Pearson's correlation value of $r=0.555$. These findings are supported by research detailing the happiness of IT workers in India (Thiagarajan and Jayasingh, 2018). The study found a significant association between 'organisational culture and alignment' with employee happiness, including a moderate positive correlation between the two (Thiagarajan and Jayasingh, 2018).

For software organisations, there are tangible benefits to promoting employee happiness within the organisation. Happier knowledge workers exhibit creative problem-solving and enhanced analytical abilities (Graziotin et al., 2014). Happier knowledge workers demonstrate higher productivity, enhance organisation reputation and lower staff turnover (Thiagarajan and Jayasingh, 2018). Employee happiness positively impacts software development productivity and quality, including enhanced performance and creativity, simultaneously lowering the adverse effects of stress, anxiety and burnout (Graziotin et al., 2018).

Limitations and directions for future research

The findings of the study show the important factors affecting the happiness of knowledge workers in a software development organisation. One of the limitations of this study is that it focuses on a large single software organisation in South Africa. Past studies have focused on the happiness of professionals, such as Physiotherapists, Engineers and Veterinarians (Calitz, et al., 2022). Future research will be conducted in the Legal profession and the Office of the Premier in local government in South Africa.

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Evaluation of the influence of data science on financial reporting quality: descriptive evidence from Nigeria

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Keywords

Data Science, Financial Reporting Quality, Data Visualization, Big Data Analytics, Cloud Accounting, Blockchain.

Abstract

Technology advances have made it much easier to amass data in huge quantities. Capitalizing on this data helps create value and growth, which is why organizations invest in people and technological capabilities to extract greater value from data. This study evaluates the influence of data science on financial reporting quality, descriptive evidence from Nigeria. Data visualization, big data analytics, cloud accounting and blockchain were used to proxy data science. Survey research design was adopted through a well-structured questionnaire, cluster random sampling was used. Frequencies and percentages were used for the descriptive analysis while multiple regression analysis was adopted for the test of hypotheses. Findings show that data visualization has a positive and significant effect with p value (0.049) and coefficient of 0.187; blockchain has positive and significant effect on financial reporting quality with p value (0.000) and coefficient of 0.389; Big data analytics shows a positive and statistically insignificant effect on financial reporting quality with p value (0.095) and coefficient of 0.095 while cloud accounting has negative and statistically insignificant effect on financial reporting quality with p value (0.074) and coefficient of 0.095. The study concludes that data science has contributed to the field of accounting and quality financial reporting. This study therefore recommends the inclusion of graphs, tables and pictures suitable of enhance understanding and be better informed for an improved decision making. Accountants, auditors and all preparers of financial report should as a matter of policy be exposed to the knowledge of data science and such curriculum should be added to all financial reporting-related fields in our institutions. Government and organizations involve in Accounting, Finance, and Investment decisions should provide data science-enabling environment and invest in data science infrastructure. Cloud accounting users should be enlightened on its safety, security and usage.

Introduction

The total amount of data created, captured, reproduced, and consumed worldwide is projected to grow rapidly, global data generation is expected to exceed 181 zettabytes over the next five years, reaching a peak in 2025 (Bartley, 2024). This data can be captured and analyzed to provide valuable insights that can support future business growth. Consequently, businesses need to employ tools that can help them in converting data into usable information, which requires the use of data science tools (Bose et al, 2022). With the advent of data science, accounting and finance professionals can take advantage of several opportunities in this rapidly evolving, disruptive, but advantageous environment (Chartered Institute of Management Accountants [CIMA], 2022). Accountants have always exploited emerging technologies to help them to complete their tasks more accurately, quickly or simply: from the incised clay tablets of the Sumerian scribes, through the adding machines of the 19th century, to the calculators and computers of the 20th century. But all of these technology developments were simple propositions by comparison with the myriad technologies that are now rapidly reshaping the worlds of business and accountancy (ACCA, 2013)

According to Aziz (2023) technological advancements are rapidly changing overall business industries. A shift from manual accounting systems to advanced algorithms, digital accounting, and automated accounting systems is the outcome of technological advancements in the business sector. Technology advancements are rapidly adopted by large business organizations focused on improved business strategies and enhancement in accounting transparency systems. Publicly traded organizations are using automated accounting and digital accounting systems to ensure the accuracy, accountability, and transparency of their

accounting systems. In recent years, the field of accounting has been transformed by the rise of Big Data. Big Data refers to large and complex sets of data that cannot be easily analyzed using traditional data processing tools. These massive datasets are becoming increasingly common in the accounting profession, as businesses generate vast amounts of financial data that must be analyzed and interpreted (Theodorakopoulos et al, 2022).

Data is at the heart of accounting, and therefore big data can help accountants deliver more value to businesses (Institute of Chartered Accountants in England and Wales (ICAEW), 2019). As the Economist aptly put it in 2017, the world's most valuable resource is no longer oil, but data. Technology advances have made it much easier to amass data in huge quantities. Capitalizing on this data helps to create value and growth, which is why organizations are investing in people and technological capabilities to extract greater value from data. Data can enable businesses to base their decision-making more on hard evidence and fact, with less emphasis on guesswork and assumptions. Furthermore, the sheer volume and breadth of opportunities to use data is increasingly transforming the business environment and providing opportunities for disruptive new business models (ICAEW, 2019). Big data by itself doesn't get us very far. We need data science to help us make sense of it and gain insights from it. Data science tools have got more user-friendly, enabling more self-service in businesses and less reliance on technical experts to run queries. The costs have also come down, with all kinds of free or cheap tools increasingly available, often linked to cloud applications (ICAEW, 2019).

The Association of Chartered Certified Accountants [ACCA] and the Institute of Management Accountants [IMA] (2013) contend that big data, cloud, mobile, and social platforms are changing the landscape for accounting and finance professionals, and they must adapt to the challenges posed by cybercrime, digital service delivery, and artificial intelligence. Similarly, the Chartered Global Management Accountant [CGMA] (2013) stresses the significance of data science, arguing that it raises significant challenges for the future role of accounting and finance. The primary obstacle for businesses to leverage their data is a talent shortage. Businesses across industries require people with data analytics skills who are prepared to challenge norms. While accountants probably don't need to become expert data scientists, they do need greater data science and analytical skills in order to derive insights from data and to enable more effective decision making and control (IFAC, 2019).

This study evaluates the effect of data science on the financial reporting quality from the perspective of 'The Big 4' Accounting firms in Nigeria (Deloitte, Ernst & Young (EY), PricewaterhouseCoopers (PwC), and Klynveld Peat Marwick Goerdeler (KPMG)). Data science was proxy with data visualization, Big data analytics, cloud accounting and blockchain; while financial reporting quality is based on the underlying fundamental qualitative characteristics (i.e. relevance and reliable representation)

Review of Related Literature

Financial Reporting Quality (FRQ)

Financial reporting quality is a broader, multi-dimensional concept, as it has to do with the simultaneous assessment of different dimensions and proper evaluation of the decision usefulness of financial reporting (financial and non-financial information) as well the mandatory and voluntary disclosures included in the corporate reports (Braam & Beest, 2013). Hussain et al (2021) posited that qualitative characteristics, according to the International Accounting Standards (IASB) and International Financial Reporting Standards (IFRS) framework, are the characteristics that make the information contained in financial statements useful to users. There are four qualitative characteristics under Financial Accounting Standards Board (FASB) and International Accounting Standards (IASB) namely (1) relevance, (2) reliability, (3) understandability, and (4) comparability. The accounting information contained in the financial reports is considered to be of a quality if it possesses a set of these characteristics (Alasbahi & P I P, 2021). Reporting quality refers to the extent to which a company's financial reports communicate the underlying economic state and performance during the period of measurement, as stated by the Financial Accounting Standards Board (Greenwood et al., 2021).

According to Hamour et al (2024) the information in financial reports can be harmful because displaying unimportant details may hide material information and make financial reports challenging to interpret. Therefore, users have a great need for high-quality information rather than quantity. Comparable, reliable, and understandable financial information can support markets' diverse transactions and operations.

Transparency and relevance are characteristics of proper financial reporting. Many scholars have recently emphasized improving FRQ to reduce information asymmetry and enhance market transparency (Hanh et al, 2023). Financial reporting quality is vital to users of financial statements and practitioners, regulators, and accounting researchers.

Data Science

Technology advances have made it much easier to amass data in huge quantities. Capitalizing on this data helps to create value and growth, which is why organizations are investing in people and technological capabilities to extract greater value from data (IFAC, 2019). The McKinsey Global Institute (2012) conducted a survey and found that 51% of the global business leaders believe that big data and data science are top priorities in their current business function. Furthermore, the Chartered Global Management Accountant [CGMA] (2013) surveyed more than 2000 Chief Financial Officers [CFOs] and finance professionals around the world and concluded that data science would revolutionize the way businesses operate over the next decade.

New types of data arise such as real-time contents and the big data analytics (BDA) that help to solve issues between users and preparers of financial reporting and accounting (Ehioghien & Addeh, 2023). Big data and data science are rapidly adopted by large business organizations focused on improved business strategies and enhancement in accounting transparency systems. Publicly traded organizations are using big data and data science systems to ensure the accuracy, accountability, and transparency of their accounting systems. By using data science technologies, they can minimize the risk of Fraud and manipulations in the accounting systems (Aziz, 2023)

The advancement of techniques like pattern recognition and natural language processing has increased the predictive capability of data science (Al-Omouh et al., 2021). Due to advancements in data collection and processing technology, the role of managers, accountants and auditors in producing, analyzing and encouraging information use has shifted away from simply providing accurate and reliable information and toward data analytics and providing a system that can be monitored and improved over time to provide accurate and reliable information (Balios et al., 2020; Abu Afifa et al., 2022). Additionally, accounting has evolved into a discipline capable of adapting to massive volumes of data due to its importance to enterprises and policymakers in acquiring information and data about economic events (Cappa et al., 2021).

Data Visualization (DV)

The Securities and Exchange Commission encourages the presentation of information or data in graphical form to improve users' ability to understand financial disclosures (Christensen et al, 2024). Data visualization has been acknowledged by researchers and practitioners as a means to enhance the quality of audit practices (American Institute of Certified Public Accountants [AICPA], Big data should be well-processed to gain meaningful insights through some techniques, including visualizing the analytic results (Mauludina et al, 2024). According to Eberhard (2020), "A visualization is defined as a visual representation of information or concepts designed to effectively communicate the content or message and improve understanding in the audience." Thus, utilizing visual elements such as charts, graphs, and infographics, data visualization can change raw data into easily understandable and visually appealing representations for the audience, particularly, investors. Data visualization is important for financial storytelling and it can transform the way organizations report and communicate financial information (Appeal, 2023)

Big Data Analytics (BDA)

Big data is described as an extremely vast and complicated collection of structured and unstructured data that are difficult to manage, handle, or analyze using typical data processing methods (Sihombing et al., 2023). According to Hasan et al. (2020), big data is knowledge that is too massive, complicated, and dynamic for traditional technologies, skills, and infrastructure to process in a reasonable amount of time. According to PWC (2017) traditional financial reporting methods have become time-consuming and cumbersome as they typically involve analyzing an organization's hundreds and thousands of transactions, individually, to form conclusions. However, with data analytics, auditors are now able to streamline the analysis of an organization's massive document trove, ensuring a higher degree of accuracy and reduction in the chances of overlooking errors. Data analytics translate data into insights that enable finance teams to unlock new

value. They can also help identify and track anomalies and outliers, which could indicate potential problems or the existence of fraud and need to be further examined (Shanawaz, 2024). According to Meiryani et al (2024) new types of data arise such as real-time contents and the big data analytics (BDA) help to solve issues between users and preparers of financial reporting and accounting. The purpose of big data in accounting is to collect, organize, and utilize data from a variety of sources to gain new business knowledge.

Cloud Accounting (CA)

According to Cloud Banking Forum (CBF) (2020) over the recent years, cloud computing has become a significant technological enabler for innovative service development. Cloud allows industries to tap into new service models, utilizing its technological advancement for new and better services to customers, improving productivity, cost-efficiency and flexibility of internal business processes. Cloud services embody redundancy, high availability and resiliency thanks to their distributed nature. Akpan et al (2023) posit that cloud accounting refers to the use of accounting software and tools that are hosted on remote servers and accessed over the internet, instead of being installed on a local computer. With cloud-based systems, multiple users can work simultaneously on the same set of data, ensuring that financial reports reflect the most current, reliable and comparable information. Cloud accounting can be seen as an important resource to improve enterprise competitiveness.

According to Christauskas and Miseviciene (2012) cloud-based accounting system is a way to manage business accounts entirely online and attained as a service, on-demand, acting similar to accounting software installed on users' computers, but performed on servers and accessible by users through their web browsers. The application of this technology in accounting offers an opportunity for the accountants to remodel their activity and practices and to be able to offer increased and relevant services (ACCA report, 2020).

Blockchain (BC)

A blockchain is a decentralized, cryptographically secured digital ledger that maintains a continuously growing list of ordered and thus immutable records of transactions (Gietzmann & Grossetti, 2021). Hailed as one of the most disruptive innovations over the last decade, blockchain has garnered much attention from academia, practitioners, and policymakers (Makarov & Schoar, 2022). Its application in the finance and business world is expected to bring about substantial change in the next-generation business processes by greatly enhancing transparency (KPMG, 2018). According to Financial Executive Research Foundation (FERF) Blockchain is a "distributed ledger" technology, meaning that all transactions recorded within a particular database are shared, synchronized, and approved across a network and verified by consensus using cryptographic algorithms. This is quite different from traditional financial ledger recording methods where transactions are recorded but are verified by a trusted third party

According to Fahdil et al (2024) blockchain technology is transforming numerous areas, including accountancy. Traditional financial reporting and auditing systems confront issues such as inefficiency, fraud risk, and a lack of transparency. Blockchain claims to solve these problems by implementing a decentralized, immutable ledger system. The rapid spread of blockchain technology brought about a new era in financial data management, which can completely transform the accounting ecosystem's efficiency, security, and transparency. Blockchain's core ideas of immutability, transparency, and cryptographic security are the keys to its revolutionary potential (Danach et al, 2024).

Theory of Innovation

The theory is by Schumpeter, who posited that innovators, who are independent inventors, could make more return with their innovations. Schumpeter (1934) asserts that innovations are always happening in the industry and at any instance of time, there is something new being innovated in the economy and for this reason, institutions needs to be cognizant of them and an accountant being expertise in data science is in tune with this. It is due to this fact that there are a variety of innovations accountants adopt and implement in order to boost the quality of financial reporting.

Schumpeter (1934) posits that innovation is not just about innovative ideas but ability to increase their practical use. In other words, innovation is defined as astounding development by firms in approaching with innovative products or the application of new operation or processes in production (Anderson et al, 2014). Technological innovations are crucial tool for strategic transformation of financial reporting to cope

with changes that are presented by the environment. Schumpeter (1939) categorized it into two major dimensions: product and service innovations. Product innovations consist of the creation of a new good or entirely new product, which more sufficiently satisfy existing or previously satisfied needs. Process innovation encompasses the adoption of a new or considerably improved operation or production.

According to Porter (1995), to compete successfully in international trade; a nation's businesses must constantly innovate and improve and upgrade their competitive advantages. For ensuring continues innovation and upgrading, it is important to make sustained investment in physical as well as intangible assets.

Empirical Review

Data Visualization and Financial Reporting Quality

Raggless et al (2024) explore best practices for designing effective data visualizations in annual reports, focusing on principles such as clarity, consistency, and audience relevance. Additionally, emerging trends such as interactive dashboards, storytelling through visual narratives, and the integration of sustainability metrics are examined. By analyzing case studies from diverse industries, the study highlights how organizations leverage visual tools to communicate financial performance, operational achievements, and strategic goals more effectively. The findings emphasize the need for balancing aesthetics with functionality, ensuring that visualizations align with organizational objectives and cater to diverse stakeholder needs

Uddin et al (2024) explore the efficacy of data visualization techniques in conveying complex financial data in annual reports for investment decision-making. Adopted questionnaires as a data collection method to get the perspective of investors after giving them an analysis of various companies' financial statements (JP Morgan, Apple Inc. HR Wallingford, Brac Bank, and ACLL Ltd) presented visually. The majority of the respondents indicated that data visualization helps them easily understand annual reports thereby helping them make informed investment decisions. The findings illustrate the significance of data visualization in annual reports for investors when they want to make investment decisions based on the financial reports presented visually.

Mauludina et al (2024) systematically review the role of big data visualization in the auditing field. Employing a qualitative approach. The study used 35 published articles extracted from different journals and reputed publishers, which served as the sample. The result showed a fluctuating pattern in the publication years, highlighting a relatively recent research area, with the highest volume noted in 2021. The findings indicated that most articles used qualitative methods, such as conceptual or case study research. The study identified nine of the main capabilities of data visualization to improve audit quality.

Christensen et al (2024) assert that The Securities and Exchange Commission encourages the presentation of information or data in graphical form to improve users' ability to understand financial disclosures. The study finds a dramatic increase in the disclosure of both qualitative and quantitative infographics in 10-K filings over time and substantial cross-sectional variation in firms' choices regarding image types, data content, and the placement of infographics within 10-Ks.

Anderson et al (2024) assert that audit standards demand revision to the audit plan and additional testing procedures whenever new information indicative of a possible material misstatement comes to light at any point during the audit. An appealing conjecture is that richer data visualizations that more transparently reveal client data abnormalities will generally facilitate these revisions. However, the study predicts using an experiment of more than 200 audit seniors, find that the extent to which auditors respond to data abnormalities revealed by richer visualizations depends on audit procedure categorization. The study manipulates audit procedure categorization by labelling otherwise identical interim audit work as risk assessment procedures or as substantive analytical procedures. Richer visualizations that more transparently reveal data abnormalities result in improved auditor judgment, but only when these abnormalities arise from risk assessment procedures. When abnormalities arise from substantive analytical procedures, finding reveals no significant response by auditors to richer visualizations of material client data abnormalities.

Chy and Buadi (2023) show how a firm can convey financial information to users by utilizing data visualization tools. The study finds that while some improvements have been noticeable in filing proxy statements, there is still more room to use graphs and charts in 10-K and annual reports. Firms should use graphs and charts more frequently so that non-financial users can decipher the underlying meaning of numbers within the shortest possible time.

Al-Katheri (2023) investigates how the inclusion of charts and graph in financial reports influences stakeholders' perceptions, including investors, analysts, and managers, regarding the economic performance of commercial banks in Saudi Arabia. The study also explores the potential benefits and limitations of incorporating charts in financial reporting. A mixed-methods approach, combining qualitative and quantitative research methods, is employed. The research involves surveys administered to stakeholders and interviews with key informants, including financial analysts, managers, and regulators. The total participants were 317 responses. The majority of responses agreed that there is a significant effect of using charts in financial reports in commercial banks in Saudi Arabia.

Big Data Analytics and Financial Reporting Quality

Theodorakopoulos et al (2024) comprehensively explore the implications of Big Data within the realm of accounting, dissecting both its potential advantages and the hurdles it presents. Additionally, it seeks to identify and thoroughly examine the challenges impeding the seamless assimilation of Big Data into accounting methodologies. By delving into diverse applications, including Auditing, Cost Management, and financial reporting, the study shed light on the multifaceted nature of Big Data's role in accounting. The paper conducts a meticulous review and synthesis of existing literature. Findings reveal that Big Data exhibits the potential to substantially transform accounting practices, offering avenues for superior decision-making and analysis.

Shalhoob et al (2024) investigate the role of big data analytics (BDA) in promoting error detection and preventing fraud in accounting operations. Used secondary method of data collection (desk study) to explore the potential impact of BDA in enhancing error and fraud prevention on six key considerations including data quality and integrity; data privacy and security; real-time monitoring and alerts; integration with internal controls; ethical implications; and human experience. Analysis shows that the BDA enhances fraud detection by integrating data from multiple sources, using sophisticated algorithms to identify anomalies. Reduces false positives and improves accuracy. However, human expertise is essential for ethical standards and transparency.

E'leimat et al (2023) explain the impact of big data on the financial reporting quality of the industrial sector in Jordan. To achieve the manuscript goals and validate hypotheses, a field study was conducted by distributing a questionnaire to 325 financial managers in industrial companies listed on the Amman Stock Exchange during a specific period. Gathered data were analyzed using structural equation modeling (SEM). The manuscript concluded that the big data dimensions, including variety, volume, and velocity, had a positive impact on financial reporting quality.

Meiryani et al (2023) aim to determine the impact of big data analysis on the quality of financial statements in Indonesia. The data used in the study is primary data obtained from the study subject in the form of a questionnaire. The data obtained is then processed using Microsoft excel and SPSS 25. The results of the hypothesis test stated that the analysis of big data has an effect on the quality of the report. Aziz (2023) focused on the impact of business intelligence and data analytics in the field of accounting. Based on the information collected from scholarly sources, data analytics, and business intelligence is helpful for business organizations in the improvement of their accounting processes and enhancing accuracy in real-time data storing and analysis. The paper also highlighted three main benefits or advantages of data analytics and business intelligence adoptions in accounting systems which include: increasing accuracy, enhancing efficiency, and improvement in the decision-making processes.

Oluwagbade et al (2023) evaluated the effect of Big Data Analytics (BDA) on audit risk assessment, task competence and audit report filing by auditors. The survey research design was used in the research. The population comprised 72 auditors drawn from private limited firms in Awka. The study employed the census sampling technique and relied on primary data, which was generated from a structured questionnaire administered to the auditors. The reliability of the instrument was determined using Cronbach's alpha. The data were analysed using descriptive and inferential statistical techniques. The hypotheses were tested using Pearson Product Moment Correlation Coefficient (PPMC). The empirical results showed that there is a significant relationship between BDA and audit risk assessment ($p < .05$); there is a significant relationship between BDA and task competence ($p < .05$); and, BDA has influenced audit report filing by auditors in Awka, Anambra State.

Winoto et al (2023) examine the influence of big data on financial reporting with Quantitative Evidence from Indonesia. Adopted primary data obtained from the study subject in the form of a questionnaire. The data obtained is processed using SPSS 25. The results of the hypothesis test stated that the analysis of big data has an effect on the quality of the report. This means big data technology as a resource internally owned company can improve the company's financial performance

Bello (2023) explores how data analytics can identify and understand unbanked and underbanked populations, improve credit scoring and risk assessment through alternative data sources, personalize financial products and services, enhance financial literacy, and facilitate digital payments and transactions. Case studies from diverse emerging economies illustrate the practical applications and success stories, such as Kenya's mobile money platform M-Pesa, India's digital lending initiatives leveraging Aadhaar and UPI, and blockchain-based financial inclusion efforts in Africa. These examples highlight the transformative impact of data-driven solutions in bridging the financial inclusion gap.

Cloud Accounting and Financial Reporting Quality

Orji and Ojimini (2024) examined the effect of Cloud accounting and organizational performance: a study of Selected companies using cloud accounting in Port Harcourt Metropolis. The study aimed at achieving the following objectives; evaluating the effect of Quickbook online on the customers satisfaction of Thermocool Showroom as well as examining the effect of systems, applications and products in data processing (SAP) cloud platform on the employee's satisfaction of total exploration and production. By obtaining relevant data through a well-designed questionnaire administered on the sample size of 130 drawn from a population of 192 using Taro Yamane statistical formula. The data of the study were analyzed using Pearson's Product Moment Correlation (PPMC) technique. The test of hypotheses showed that Quickbook online has significant effect on customer satisfaction in Thermocool showroom as well as Systems, Applications and Products in data processing (SAP) cloud platform on employee satisfaction in oil exploration companies in Nigeria.

Agrawal and Jethy (2024) present a comprehensive literature review aimed at comparing various cloud-based accounting software platforms based on their features, performance, and user satisfaction. Through an analysis of existing research articles, the paper synthesizes key findings, identifies common trends, and highlights differences among different software solutions. The review provides valuable insights for businesses and practitioners in selecting the most suitable cloud-based accounting software for their needs. Najmaldin et al (2024) examine the literature using mixed methods to assess current information and knowledge gaps related to cloud accounting processes in SMEs. Therefore, from this point of view, cloud accounting is crucial for businesses because companies provide information to multiple parties and therefore require reliable and protected financial reporting.

Wahhab et al (2024) elucidate the significant impact of cloud accounting technologies as a type of innovation in information technology and its contribution to enhancing the financial reporting standard within the scope of international standards. The system comprises two axes, and the total number of questions reached 26. The distribution was conducted among a subset of employees in publicly traded corporations. 118 participants were included in the study conducted on the Iraqi Stock Exchange. The hypotheses were examined using descriptive statistics, the Pearson correlation matrix, and the structural equation modelling technique with the statistical software SPSS version 26. The findings demonstrated a statistically significant influence of cloud accounting, namely at a rate of 26.6%, on attaining high-quality financial reporting.

Abdallah et al (2024) determine the effect of using cloud computing on the quality of financial reports in the banking sector, specifically Banque Misr in Egypt. The focus was on examining the relationship between the characteristics of cloud computing and financial reporting quality. A quantitative approach was adopted using a questionnaire distributed to 96 employees of Banque Misr. The findings showed cloud computing characteristics positively influence financial reporting quality, accounting for 49.7% of the variance. Specifically, measured service and broad network access had the strongest positive impacts. All cloud computing attributes were significantly correlated with a comparability of financial reports.

Oyewobi and Adeyemi (2024) examined cloud-based Accounting Information Systems (AIS) adoption and financial reporting quality within Nigeria's Information and Communication Technology (ICT) sector. The population of the study consists of all eight (8) Information and Communication Technology (ICT)

enterprises that are listed on the Nigerian Exchange Group as of 31st December 2022. Over a decade-long period from 2013 to 2022. Utilizing a Panel Regression Technique (Random Effect Model), the study identifies a significant overall effect of Cloud-Based AIS on the Financial Reporting Quality of Listed ICT Firms in Nigeria. Moreover, it highlights the significant influence of Cloud Security Investment on financial reporting quality among ICT firms in Nigeria, while Cloud Expenditure Growth is found to have no statistically significant effect.

Kmaleh (2023) examine the impact of cloud computing on the quality of accounting information and its alignment with international financial reporting standards. The study combined theoretical exploration with practical examination of files and interviews with relevant stakeholders, such as managers and accountants. The study yielded That adoption of cloud computing positively influences the quality and credibility of accounting information. However, there are inherent risks associated with cloud computing, including security, contractual issues, and potential human errors. These risks must be addressed.

Fadipe (2023) evaluates the impact of Cloud Accounting on timeliness of financial reporting of selected firms in Nigeria; examine the effect of IaaS (Infrastructure as-a-Service), PaaS (Platform as-a-service) and SaaS (Software as-a-Service) on timeliness of financial reporting of selected firms in Nigeria. The study employed an ex-post facto approach and a survey research design. Mixed methodology was adopted. The cost associated with implementing cloud-based accounting systems, represented by the CAC coefficient, shows an almost negligible impact on FRQ. The analysis reveals that IaaS does not have a statistically significant impact on organizational performance in financial reporting. On the other hand, PaaS has a statistically significant and positive impact on organizational performance in financial reporting. SaaS also demonstrates a statistically significant and positive impact on organizational performance in financial reporting. Organizations that utilize SaaS tend to achieve better timeliness in their financial reporting.

Akpan et al (2023) examined the effect of cloud accounting on financial reporting quality of selected deposit money banks in Nigeria. Platform as a service (Paas), network as a service (Naas) and software as a service (Saas) were the cloud accounting proxies employed to ascertain their effects on financial reporting quality. The research design adopted in the study was the survey research design since primary data was used. The instrument for data collection was the researcher constructed five-point Likert questionnaire. Purposive sampling technique was used to select a sample size 120 staff members of selected deposit money banks in Nigeria. The robust least square regression technique was employed to analyze the data as well as test the three hypotheses formulated for the study. It was found out that platform as a service (Paas) has an insignificant effect on financial reporting quality. It was also found out that network as a service (Naas) and software ware as a service (Saas) have significant effect on financial reporting quality of selected deposit money banks in Nigeria.

Blockchain and Financial Reporting Quality

Fahdil et al (2024) investigate how blockchain can improve transparency, accuracy, and security in accounting practices, as well as to assess the implications for auditors and stakeholders. A comprehensive literature study was undertaken to cover recent breakthroughs and applications of blockchain in accounting. The study found that blockchain technology enhances the trustworthiness and transparency of financial information. Blockchain's immutability minimizes the danger of data tampering and fraud, with 85% of studied businesses reporting a drop in fraudulent activity. Smart contracts and automated verification methods simplify auditing procedures, resulting in a 30% reduction in audit time and a 20% decrease in audit costs. Approximately 70% of organizations reported a 25% improvement in data accuracy, with 65% reporting a 40% gain in process efficiency.

Danach et al (2024) explore the various ramifications of blockchain adoption in accounting, concentrating on how it affects regulatory compliance, audit trail integrity, cost-effectiveness, smart contracts, and financial reporting accuracy. It offers a thorough grasp of how financial reporting and auditing processes are changing in the blockchain era. The study also emphasizes the significance of understanding how blockchain technology changes traditional accounting practices as more companies incorporate it into their financial operations. It draws attention to the benefits of blockchain technology. Also, it emphasizes the need for flexibility and compliance with legal requirements to fully realize its potential in the fields of audit assurance and financial reporting.

Liao et al (2024) study the impact of blockchain technology on corporate financial reporting quality based on the staggered implementation of blockchain-based e-invoice systems by provincial and municipal governments in China since 2018. Using a difference-in-differences approach with a sample of listed firms in China from 2016 to 2022, find that the accrual quality and earnings informativeness improve post-adoption. This treatment effect is more pronounced for firms with more complex operations and those located in technologically advanced and market-oriented environments, but is similar across firms with varying earnings management incentives. Blockchain adoption is associated with fewer error-related accounting restatements, but not with non-error-related restatements or corporate tax avoidance.

Dashkevich et al (2024) presents Blockchain Financial Statements (BFS), an innovative accounting system designed to address accounting fraud, reduce data manipulation, and misrepresentation of company financial claims, by enhancing availability of the real-time and tamper-proof accounting data, underpinned by a verifiable approach to financial transactions and reporting. Incorporating a Design Science Research Methodology with Domain-Driven Design, the study constructs a BFS artefact that harmonizes accounting standards with blockchain technology and business orchestration. The resulting Java implementation of the BFS demonstrates successful integration of blockchain technology into accounting practices, showing potential in real-time validation of transactions, immutable record-keeping, and enhancement of transparency and efficiency of financial reporting.

Mirza (2024) assess the impact of blockchain technology on financial reporting in small and medium-sized enterprises (SMEs) in Pakistan. Adopted secondary data collection. Findings indicated that blockchain's decentralized ledger system enhances transparency and accuracy in financial data recording and reporting. It reduces the risk of fraud and manipulation due to its immutable nature, ensuring that transactions are securely recorded and traceable.

Aro et al (2024) observed that by utilizing blockchain decentralized ledgers, organizations can ensure that financial transactions and reporting are immutable, verifiable, and accessible in real-time. This enhances the reliability of financial data, mitigating risks associated with fraud and misreporting. The study includes case analyses of organizations that have successfully integrated blockchain into their governance frameworks, illustrating how these implementations have improved operational efficiency and stakeholder confidence. Key areas of focus include the use of smart contracts to automate compliance and reporting processes, the role of blockchain in enhancing shareholder engagement, and the impact of transparent reporting on investor relations.

Udeh et al (2024) explores the transformative potential of blockchain technology in green finance, aiming to assess how it enhances transparency, efficiency, and trust within the sector. Employing a systematic literature review and content analysis, the research scrutinizes peer-reviewed journals, industry reports, and case studies to elucidate blockchain's impact on sustainable financial practices. Key findings reveal that blockchain technology significantly contributes to the transparency and efficiency of green finance mechanisms, such as green bonds and sustainability-linked loans, by providing immutable, transparent, and secure transaction records. This technological integration fosters trust among stakeholders, including investors, regulators, and beneficiaries.

Methodology

The study adopted survey research design; the population is made up of the entire staff of "The Big 4" (Deloitte, Ernst & Young (EY), PricewaterhouseCoopers (PwC), and Klynveld Peat Marwick Goerdeler (KPMG)) as at 31st, January 2025. Cluster random sampling techniques was adopted to select 120 staff of each firm. The questionnaires were equally shared among "The Big 4" (Deloitte, PricewaterhouseCoopers, Ernst and Young and KPMG), their office at the major cities (Lagos, Portharcourt and Abuja). 10 questionnaire each was distributed for each of the 3 branched for the 4 audit firms.

Data Analysis Technique and Model Specification

Frequencies and percentages are used to analysis the section A of the questionnaire and each item in the other section to review the raw data collected, while crobach's alpha was used to check the reliability of the instrument used. Multiple regression analysis was used to test the hypothesis formulated.

The broad of objective of the model will be to specify and estimate to examine the effect of data science on quality of financial reporting Multiple regression model will be adopted as stated below:

$$QFR = \beta_0 + \beta_1 DV + \beta_2 BDA + \beta_3 CA + \beta_4 BC + e$$

Where:

QFR= Quality financial Reporting

DV = Data visualization

BDA = Big data Analytics

CA = Cloud Accounting

BC = Blockchain

e = Stochastic term

β_0 β_4 = regression coefficient

Data Presentation and Analysis

Table 1: Demography of Respondents

S/N	VARIABLE	FREQUENCY	PERCENTAGE %
1	Gender:		
	Male	80	64.4
	Female	37	31.6
	Total	117	100
2	Age:		
	Below 30years	44	37.6
	31-40years	37	31.6
	41-50years	29	24.8
	Above 50	7	6.0
	Total	117	100
3	Highest Educational Qualification:		
	ND/DIPLOMA/NCE	11	9.4
	HND/BSc.	56	47.9
	MSc.	35	29.9
	Ph.D	15	12.8
	Total	117	100
4	Professional Status		
	Qualified	83	70.9
	Not- Qualified	34	29.1
	Total	117	100
5	Marital Status		
	Single	43	36.8
	Married	65	55.6
	Divorced	9	7.7
	Total	117	100
6	Firm Name		
	Deloitte	30	25.6
	PricewaterhouseCoopers	29	24.8
	Ernst and Young	29	24.8
	KPMG	29	24.8
	Total	117	100

Source: Field Survey, 2025 (SPSS 23)

From the table 4.2.1 above which shows the demographic presentation of the respondents. The gender of the respondents is 80(64.4%) and 37(31.6%) male and female respectively, we concluded that the number of males more than that of female respondents. The ages of the respondents as shown from the above table, 44(37.6%) were 30years and below, 37(31.6%) were between the ages of 31 to 40years, 29(24.8%) were between 41 to 50 years, 7(6.0%) respondents were between 50years and above. We confirmed that ages 30 and below were the highest among the respondents. The highest educational qualifications of the respondents shows that 11(9.4%) have ND/ NCE/ Diploma, 56(47.9%) have HND/BSc. /BA, 35(29.9%) have Masters and 15(12.8%) have Doctor of Philosophy. The professional qualification of the respondents was also included in the questionnaire, it shows that 83(70.9%) Of the respondents were professionally qualified accountants while 34(29.1%) were not yet qualified. The firm name was included and it shows that 30(25.6%)

of the respondents are staff of Deloitte, 29(24.8%) were from PricewaterhouseCoopers, 29(24.8%) are from Ernest and Young and 29(24.8%) are from KPMG. The marital status of the respondents shows that 43(36.8%) were single, 65(55.6%) were married and 9(7.7%) were divorced.

Table 2. Reliability Test (Cronbach's Alpha)
Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.952	.953	20

Source: Field Survey, 2025 (SPSS 23) Output

Using the rule of Geory and Mallery (2003), the table 4.2.2 above which shows the reliability test of the variables. The result for the variable reveals an excellent result of 0.953. Therefore, the degree to which an instrument yields is consistent.

Question Analysis

Question One: To what extent has Data Visualization (DV) affects Quality of Financial Reporting?

Below are the description and presentation of the sampled respondents' answers to question one in table.3.

Table 3. Effect of Data Visualization (DV) on Quality of Financial Reporting
Data Visualization

SN	Statement	SA	A	UN	D	SD
DV1	Data visualization is important for financial storytelling and it can transform the way organizations report and communicate financial information.	65 (55.6%)	49 (41.9%)	1 (0.9%)	2 (1.7%)	0 (0%)
DV 2	Data visualization has been playing a pivotal role in displaying complex raw data into easily understandable visual graphics	52 (44.4%)	63 (53.8%)	1 (0.9%)	1 (0.9%)	0 (0%)
DV 3	There still needs to be more use of data visualization tools to communicate with the financial and non-financial users of financial data	82 (70.1%)	32 (27.4%)	1 (0.9%)	2 (1.7%)	0 (0%)
DV 4	Data visualization offers a powerful tool to help simplify and communicate complex financial information and data to ease its understanding by various consumers of the data such as investors	54 (46.2%)	61 (52.1%)	1 (0.9%)	1 (0.9%)	0 (0%)

Source: Field Survey, 2025 (SPSS 23) Output

From the table 2.2.3 above, it shows that most of the respondent shows a level of agreement with the statement that "Data visualization is important for financial storytelling and it can transform the way organizations report and communicate financial information (DV1)", 55.6% (65) and 41.9% (49) for strongly agreed and agreed respectively, 0.9 % (1) were neutral and 1.7% (2) were disagreed. 44.4% (52) and 53.8 % (63) were strongly agreed and agreed to the second statement "Data visualization has been playing a pivotal role in displaying complex raw data into easily understandable visual graphics (DV2)" while 0.9 % (1) were neutral and 0.9% (1) were disagreed. Also, 70.1 % (82) and 29.2% (56) are strongly agreed and agreed to the third statement "There still needs to be more use of data visualization tools to communicate with the financial and non-financial users of financial data (DV3)" while 0.9 % (1) was neutral and 1.7% (2) were disagreed. 46.2% (54) and 52.1% (61) were strongly agreed and agreed to the fourth statement "Data visualization offers a powerful tool to help simplify and communicate complex financial information and data to ease its understanding by various consumers of the data such as investors (DV4)" while 0.9% (1) undecided and 0.9% (1) disagreed.

Question Two: What is the effect of Big Data Analytics (DA) on Quality of Financial Reporting?

Below are the description and presentation of the sampled respondents' answers to question two in table 4.

Table 4. Effect of Big Data Analytics (DA) on Quality of Financial Reporting
Big Data Analytics

SN	Statement	SA	A	UN	D	SD
BDA1	Data analytics help auditors are now able to streamline the analysis of an organization's massive document trove, ensuring a higher degree of accuracy and reduction in the chances of overlooking errors	78 (66.7%)	32 (27.4%)	6 (5.1%)	1 (0.9%)	0 (0%)
BDA 2	The purpose of big data in accounting is to collect, organize, and utilize data from a variety of sources to gain new business knowledge.	69 (59.0%)	33 (28.2%)	13 (11%)	2 (1.7%)	0 (0%)
BDA 3	The use of Big Data in accounting has opened up new opportunities for accountants to gain insights into financial data and make better decisions	66 (56.4%)	49 (41.9%)	1 (0.9%)	1 (0.9%)	0 (0%)
BDA 4	Big data offers huge potential to improve financial decision-making, risk management, fraud detection, and operational efficiency	87 (74.7%)	29 (24.8%)	1 (0.9%)	0 (0%)	0 (0%)

Source: Field Survey, 2025 (SPSS 23) Output

From the table 4 above, it shows that most of the respondent shows a level of agreement with the statement that “Data analytics help auditors are now able to streamline the analysis of an organization's massive document trove, ensuring a higher degree of accuracy and reduction in the chances of overlooking errors (BDA1)”, 66.7% (78) and 27.4 % (32) for strongly agreed and agreed respectively, 5.1 % (6) were neutral and 0.9% (1) were disagreed . 59% (69) and 28.2 % (33) were strongly agreed and agreed to the second statement “The purpose of big data in accounting is to collect, organize, and utilize data from a variety of sources to gain new business knowledge. (BDA2)” while 11.1 % (13) neutral and 1.7% (2) disagreed. 56.4 % (66) and 41.9% (49) are strongly agreed and agreed to the third statement “The use of Big Data in accounting has opened up new opportunities for accountants to gain insights into financial data and make better decisions (BDA3)” while 0.9 % (1) was neutral and 0.9 % (1) disagreed. 74.7% (87) and 24.8% (29) were strongly agreed and agreed to the fourth statement “Big data offers huge potential to improve financial decision-making, risk management, fraud detection, and operational efficiency (BDA4)” while 0.9% (1) was undecided.

Question Three: To what extent has Cloud Accounting (CA) influence Quality of Financial Reporting?

Below are the description and presentation of the sampled respondents' answers to question three in table 5.

Table 5. Effect of Cloud Accounting (CA) on Quality of Financial Reporting
Cloud Accounting

SN	Statement	SA	A	UN	D	SD
CA1	Cloud allows industries to tap into new service models, utilizing its technological advancement for new and better services to customers, improving productivity, cost-efficiency and flexibility of internal business processes	63 (53.8%)	53 (45.3%)	1 (0.9%)	0 (0%)	0 (0%)
CA 2	With cloud-based systems, multiple users can work simultaneously on the same set of data, ensuring that financial reports reflect the most current, reliable and comparable information	91 (77.8%)	24 (20.5%)	0 (0%)	2 (1.7%)	0 (0%)
CA 3	The application of this technology in accounting offers an opportunity for the accountants to remodel their activity and practices and to be able to offer increased and relevant services	85 (72.6%)	30 (25.6%)	2 (1.7%)	2 (1.7%)	0 (0%)
CA 4	Cloud-based accounting software has gained significant traction in recent years as businesses increasingly transition towards digital solutions for their financial management needs	76 (65%)	40 (34.2%)	1 (0.9%)	0 (0%)	0 (0%)

Source: Field Survey, 2025 (SPSS 23) Output

From the table 5 above, it shows that most of the respondent shows a level of agreement with the statement that “Cloud allows industries to tap into new service models, utilizing its technological advancement for new and better services to customers, improving productivity, cost-efficiency and flexibility of internal business

processes (CA1)", 53.8% (63) and 45.3 % (53) for strongly agreed and agreed respectively, 0.9 %(1) neutral. 77.8% (91) and 20.5 % (24) were strongly agreed and agreed to the second statement "With cloud-based systems, multiple users can work simultaneously on the same set of data, ensuring that financial reports reflect the most current, reliable and comparable information. (CA2)" while 1.7 % (2) disagreed. Also, 72.6 % (85) and 25.6% (30) are strongly agreed and agreed to the third statement "The application of this technology in accounting offers an opportunity for the accountants to remodel their activity and practices and to be able to offer increased and relevant services (CA3)" while 1.7 % (2) was neutral, 1.7% (2) disagreed. 65% (76) and 46.9% (34.2) were strongly agreed and agreed to the fourth statement "Cloud-based accounting software has gained significant traction in recent years as businesses increasingly transition towards digital solutions for their financial management needs (CA4)" while 0.9% (1) was undecided.

Question Four: How does Blockchain affect Quality of Financial Reporting?

Below are the description and presentation of the sampled respondents' answers to question three in table 6

Table 6. Effect of Blockchain on Quality of Financial Reporting
Blockchain

SN	Statement	SA	A	UN	D	SD
BC1	The rapid spread of blockchain technology brought about a new era in financial data management, which can completely transform the accounting ecosystem's efficiency, security, and transparency	65 (55.6%)	49 (41.9%)	1 (0.9%)	2 (1.7%)	0 (0%)
BC 2	Blockchain is a digital ledger that allows capturing of transactions conducted among several parties on real-time and serves as a decentralized database where each participant keeps an identical copy of the ledger	65 (55.6%)	49 (41.9%)	1 (0.9%)	0 (0%)	2 (1.7%)
BC 3	Blockchain's decentralized ledger system enhances transparency and accuracy in financial data recording and reporting	63 (53.8%)	51 (43.6%)	1 (0.9%)	2 (1.7%)	0 (0%)
BC 4	Blockchain, with its decentralized and non-tamperable features, can effectively improve the informationization and intelligence of accounting bookkeeping and greatly enhance the quality of enterprise financial reports.	66 (56.4%)	47 (40.2%)	2 (1.7%)	2 (1.7%)	0 (0%)

Source: Field Survey, 2025 (SPSS 23) Output

From the table 2.2.6 above, it shows that most of the respondent shows a level of agreement with the statement that "The rapid spread of blockchain technology brought about a new era in financial data management, which can completely transform the accounting ecosystem's efficiency, security, and transparency (CA1)", 55.6% (65) and 41.9 % (49) for strongly agreed and agreed respectively, 0.9 % (1) were neutral, 1.7% (2) disagreed . 55.6% (65) and 41.9 % (49) were strongly agreed and agreed to the second statement "Blockchain is a digital ledger that allows capturing of transactions conducted among several parties on real-time and serves as a decentralized database where each participant keeps an identical copy of the ledger (CA2)" while 0.9 % (1) was neutral and 1.7% (2) strongly disagreed. Also, 53.8 % (63) and 43.6% (51) are strongly agreed and agreed to the third statement "Blockchain's decentralized ledger system enhances transparency and accuracy in financial data recording and reporting (BC3)" while 0.9 % (1) was neutral and 1.7% (2) disagreed. 56.4% (66) and 40.2% (47) were strongly agreed and agreed to the fourth statement "Blockchain, with its decentralized and non-tamperable features, can effectively improve the informationization and intelligence of accounting bookkeeping and greatly enhance the quality of enterprise financial reports. (BC4)" while 1.7% (2) were undecided and 1.7% (2) disagreed.

Table 7 Effect on Quality of Financial reporting

SN	Question	SA	A	UN	D	SD
QFR1	Financial reporting quality is one of the main pillars in building modern business	68 (58.1%)	42 (35.9%)	6 (5.1%)	1 (0.9%)	0 (0%)
QFR 2	Reporting quality refers to the extent to which a company's financial reports communicate the underlying economic state and performance during the period of measurement, as stated by the	99 (84.6%)	14 (12%)	3 (2.6%)	1 (0.9%)	0 (0%)

	Financial Accounting Standards Board					
QFR 3	It is essential to provide high-quality accounting information to influence users in making investment decisions, prediction, and to enhance market efficiency	78 (66.7%)	33 (28.2%)	4 (3.4%)	2 (1.7%)	0 (0%)
QFR 4	High quality financial reporting reduces information risks which is important for the safety of all the participants on the capital market, for the stability of the financial system, and for the lowering of the financial crisis risks	70 (59.8%)	44 (37.6%)	2 (1.7%)	1 (0.9%)	0 (0%)

Source: Field Survey, 2025 (SPSS 23) Output

From the table 7 above, it shows that most of the respondent shows a level of agreement with the statement that “Financial reporting quality is one of the main pillars in building modern business (QFR1)”, 58.1% (68) and 35.9 % (42) for strongly agreed and agreed respectively, 5.1 % (6) were neutral and 0.9% (1) were disagreed. 84.6% (99) and 12 % (14) were strongly agreed and agreed to the second statement “Reporting quality refers to the extent to which a company's financial reports communicate the underlying economic state and performance during the period of measurement, as stated by the Financial Accounting Standards Board (QFR2)”. Also, 66.7 % (78) and 28.2% (33) are strongly agreed and agreed to the third statement “It is essential to provide high-quality accounting information to influence users in making investment decisions, prediction, and to enhance market efficiency (QFR3)” while 3.4% (4) was neutral and 1.7% (2) disagreed. 59.8% (70) and 37.6% (44) were strongly agreed and agreed to the fourth statement “High quality financial reporting reduces information risks which is important for the safety of all the participants on the capital market, for the stability of the financial system, and for the lowering of the financial crisis risks. (QFR4)” while 1.7% (2) were undecided and 0.9% (1) disagreed.

Test of hypotheses

Table 8 Model Summary

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.542 ^a	.294	.268	.44540	1.599

a. Predictors: (Constant), BC, BDA, CA, DV

b. Dependent Variable: QFR

From the table 8 above, The R value is 0.542 which indicated a good level of prediction of the independent variables (data visualization, big data analytics, cloud accounting and blockchain). Also, the R² which is the coefficient of determination, that is the proportion of dependent variable (quality financial reporting) that can be explain by the independent variables (data visualization, big data analytics, cloud accounting and blockchain). The value of the R² is 0.294 that is the independent variables can explain 29% of the dependent variable. Also, the Dubin-Watson test shows a value of 1.599 which is less than 2, this implies that the model is appropriate.

Table 9 Anova

ANOVA^a

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	9.234	4	2.308	11.636	.000 ^b
	Residual	22.219	112	.198		
	Total	31.453	116			

a. Dependent Variable: QFR

b. Predictors: (Constant), BC, BDA, CA, DV

From the table 9 above (the Anova table) which shows whether the overall regression model is of good fit or not. From the table the value of p is 0.000 which shows that the independent variables are statically significantly predict the dependent variable. This shows that the regression model is a good fit of the data.

Table 10

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	2.514	.526		4.781	.000
DV	.187	.094	.208	1.986	.049
BDA	.095	.110	.080	.866	.388
CA	-.208	.115	-.184	-1.806	.074
BC	.389	.099	.440	3.917	.000

a. Dependent Variable: QFR

H₀₁: Data Visualization has no significant effect on the Quality of Financial Reporting

From the table 10, it can be seen that data visualization have a positive and significant effect on the quality of financial reporting, the p value (0.049) is less than 0.05 level of significance with a coefficient of 0.187. This shows that data visualization can increase the quality of financial reporting by approximately 19%. This means that data visualization may boost the quality of financial reporting. Based on this result we reject our null hypothesis that data visualization has no significant effect on the quality of financial reporting and accept the alternate hypothesis that data visualization has significant effect on the quality of financial reporting.

H₀₂: There is no significant effect of Big Data Analytics on the Quality of Financial Reporting

From the table 10, it can be seen that big data analytics have a positive and insignificant effect on the quality of financial reporting, the p value (0.095) is greater than 0.05 level of significance with a coefficient of 0.095. Based on this result we accept our null hypothesis that big data analytics has no significant effect on the quality of financial reporting and reject the alternate hypothesis that big data analytics has significant effect on the quality of financial reporting.

H₀₃: Cloud Accounting has no significant impact on the Quality of Financial Reporting

From the table 10, it can be seen that Cloud Accounting have negative and insignificant effect on the quality of financial reporting, the p value (0.074) is greater than 0.05 level of significance with a coefficient of 0.095. Based on this result we accept our null hypothesis that Cloud Accounting has no significant effect on the quality of financial reporting and reject the alternate hypothesis that Cloud Accounting has significant effect on the quality of financial reporting.

H₀₁: There is no significant effect of Blockchain on the Quality

From the table 10, it can be seen that of blockchain have a positive and significant effect on the quality of financial reporting, the p value (0.000) is less than 0.05 level of significance with a coefficient of 0.389. This shows that of blockchain can increase the quality of financial reporting by approximately 39%. This means that of blockchain may boost the quality of financial reporting. Based on this result we reject our null hypothesis that blockchain has no significant effect on the quality of financial reporting and accept the alternate hypothesis that blockchain has significant effect on the quality of financial reporting.

Discussion of Findings

From the analysis, the study found out that data visualization has positive and significant effect on financial reporting quality, the result is in line with the findings of Uddin et al. (2024) while to the best of the knowledge of the researcher no study has any contrary findings. Big data analytics has positive but insignificant effect on financial reporting quality, this was supported by the result of E'leimat et al. (2023), Saleh et al (2022), they found out that big data analytics has positive effect on financial information. While the study of Younis (2020) and Oluwagbade et al (2023) found significant effect of big data analytics on accounting information and audit risk respectively. Cloud accounting has negative and insignificant effect on quality of financial reporting, majority of the study on cloud accounting and quality of financial reporting, among others are Wahhab et al. (2024), Abdallah et al. (2024) and Akpan (2023) found a significant and positive effect quality of financial reporting while no study has been discovered that has supported result with this study. Blockchain has positive and significant effect on quality of financial reporting, this finding was supported by Fahdil et al. (2024) and Liao et al. (2024) while no study has been discovered that contradict the findings.

Conclusion and Recommendation

In line with the findings of the study, data science is an important development that is relevant to accounting practices and reporting. therefore, we conclude that data science has contributed to the field of accounting and quality financial reporting, its application is of best practices for designing effective data visualizations in annual reports, focusing on principles such as clarity, consistency, and audience relevance; it explores the efficacy of data visualization techniques in conveying complex financial data in annual reports for investment decision-making. Through the use of big data analytics (BDA) data science promotes error detection and prevent fraud in accounting operations; increasing accuracy, enhancing efficiency, and improvement in the decision-making processes. Blockchain technology enhances the trustworthiness and transparency of financial information. Blockchain's immutability minimizes the danger of data tampering and fraud, improved operational efficiency and stakeholder confidence. Cloud accounting relies on multiple components, including customers, infrastructure, applications, and platforms and there are inherent risks associated with cloud accounting, including security, contractual issues, and potential human errors. Hence negative, though insignificant effect.

This study therefore recommends the inclusion of graphs, tables and pictures suitable of enhance understanding and be better informed for an improved decision making. Accountants, auditors and all preparers of financial report should as a matter of policy be exposed to the knowledge of data science and such curriculum should be added to all financial reporting related fields in our institutions. Government and organizations involve in Accounting, Finance and Investment decisions should provide data science enabling environment and invest in data science infrastructure. Users of cloud accounting should be enlightened on the safety and security of data and to encourage usage and application.

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The relationship between climate change, macroeconomic indicators and bank performance

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Keywords

Climate Change, Banks Performance, Return on Equity, Net Interest Margin, Return on Assets, Temperature at 2 Meters, Precipitation Sum Average

Abstract

This study is pursuing research on the influence of climate change and macroeconomic factors on bank performance is essential for risk management, long-term sustainability, regulatory compliance, reputation management, and strategic planning. It also aligns banks with global efforts to address climate change and its potential economic consequences. The study makes use of quantitative analysis using secondary data sourced from Iress, IMF database, SARB and the data was collected in quarterly format from 2000 to 2022. The study applied the multiple regression analysis, and the aim was to create a model that connects climate change to banks performance. Climate affect macroeconomic indicators which affect banks or climate change affect banks directly. The model uses climate change and macroeconomic variables as inputs, and the climate change variables were obtained from the two sources namely the climate watch online platform (greenhouse gas emission) and the World Bank climate knowledge portal (temperature and precipitation) emission) and the World Bank climate knowledge portal (temperature and precipitation). Macroeconomic inputs variables include inflation, changes in economic output and exchange rates. The data variables were gathered from Iress, IMF database and the SARB. The analysis of the data was done through statistical software called EViews. The findings revealed that both measures of climate change have a negative effect on bank performance thus profitability. The results also indicated that growth as measured by GDP and inflation are important factors determining the performance of the bank performance. The results obtained imply that policies aimed at mitigating the effects of climate change on the bank performance should be pursued.

Introduction

One of the most important issues of our day is climate change, which has a profound impact on ecosystems, economies, and societies all over the world. Comprehending its influence on the banking industry is essential for formulating efficacious approaches to alleviate hazards and leverage prospects. Significant obstacles are presented by climate change to companies in all sectors, including banking. It is critical to comprehend how the financial performance of banks is impacted by climate change as the world struggles with its effects. With an emphasis on South Africa, this study looks at how climate change affects bank performance to address this gap in the literature.

The banking industry is essential to the modern economy because it is the foundation upon which the whole financial system is built, moreover offers financial services that make it easier for people to save, invest, and lend money. Banks are financial intermediaries that take deposits from both private citizens and commercial clients to use the money for loans and other financial services. For the economy to allocate capital efficiently, this intermediation role is crucial (Beck, 2020).

Considering the significance of the banking industry to the economy, it is imperative to comprehend the ways in which external factors, like climate change can impact its stability and performance. For banks, climate change brings with its opportunities as well as risks. These risks include reputational, liability, and physical risks to bank assets (Bank of England, 2019). For banks to create strategies to effectively manage these risks and guarantee their long-term sustainability, they must have a thorough understanding of them.

It is crucial for regulators, legislators, investors, and banks themselves to comprehend how climate change affects bank performance. Authorities must guarantee that banks are suitably equipped to handle risks associated with climate change, and legislators must create policies and incentives that encourage

sustainable practices in the banking industry. On the other hand, investors must determine how long-term banks will remain viable in a changing environment and allocate their capital appropriately. In addition, investors' and consumers' preferences are shifting in favour of ecologically friendly and sustainable practices due to climate change. Financial institutions that do not adjust to these shifting inclinations run the risk of losing investors and clients (KPMG, 2020).

Many industries are witnessing the effects of climate change, which can cause anything from physical harm to assets to supply chain disruptions and modifications in customer behaviour. For instance, the agricultural industry faces difficulties like shifting growing seasons, a lack of water, and an increase in the pressure from pests and diseases (Lesk et al., 2016). Because there are more extreme weather events, the insurance industry is seeing an increase in claims related to climate change (Linnerooth-Bayer et al., 2019). To reduce greenhouse gas emissions, the energy sector is transitioning to renewable energy sources (IEA, 2020).

Examining how climate change affects banks' financial performance is the goal of this study. The following are the specific goals to evaluate the impact of risks associated with climate change on banks' financial performance, investigating the tactics used by banks to reduce risks associated with climate change and take advantage of opportunities. Moreover, to determine how South African bank executives perceive and are aware of the risks associated with climate change and to offer suggestions to banks on how to improve their ability to withstand risks associated with climate change and take advantage of chances for sustainable growth.

Moreover, study intends to add to the expanding body of knowledge on climate change and its effects on the banking industry by illuminating these issues. The results of this study are expected to influence policy choices, direct bank strategic planning, and eventually aid in the development of a more robust and long-lasting financial system.

An urgent global issue, climate change has broad ramifications for companies in all sectors of the economy. Rising sea levels, more frequent and severe natural disasters, and altered precipitation patterns are some of the environmental changes brought about by the increase in global temperatures, which is mostly due to human activity like burning fossil fuels and deforestation (IPCC, 2014). Global businesses face enormous challenges because of these changes.

The growing possibility of supply chain disruptions is one of the main effects of climate change on businesses. Hurricanes, floods, and wildfires are examples of extreme weather events that can harm transportation networks, impair infrastructure, and cause shortages of raw materials, which can affect the processes involved in production and distribution (Hallegatte et al., 2016).

Additionally, the behaviour and preferences of consumers are being impacted by climate change. Concerns about the long-term effects of climate change and growing environmental awareness have led to an increase in the demand for sustainable goods and services (Accenture, 2020).

Businesses are realizing more and more that they must adapt to and lessen the effects of climate change in response to these difficulties. Numerous businesses are putting plans into place to lower their energy consumption, increase their resilience to risks associated with climate change, and decrease their greenhouse gas emissions (CDP, 2020).

The banking industry faces both opportunities and risks because of climate change. Banks are vulnerable to a range of climate change-related risks, such as: (i) Physical Risks: According to the Bank of England (2019), climate change may cause more frequent and severe natural disasters like storms, floods, and wildfires. These events could harm bank property, cause operational disruptions, and lead to loan defaults. (ii) Transition Risks: Banks may be exposed to risks associated with regulatory, technological, and market shifts as governments and businesses shift to a low-carbon economy. These developments may have an impact on the value of the banks' loan portfolios and investments (Carney, 2015). (iii) Reputational Risks: According to KPMG (2019), banks that are thought to be causing climate change or neglecting to address its risks run the risk of losing their good name, which could result in a decline in business and investor confidence. Because of the threats to financial stability and the chances it creates for creativity and sustainable growth, climate change has a significant impact on the banking industry.

Moreover, despite of these risks that the banking sector face there are also opportunities that arise which includes (i) Green Finance: Banks have an opportunity to create new revenue streams and draw in environmentally conscious customers due to the growing demand for sustainable finance products like

green bonds and loans (UNEP, 2018). (ii) Risk Management Services: Banks can assist businesses in evaluating and managing risks associated with climate change by offering risk management services, such as creating insurance plans for extreme weather occurrences (McKinsey, 2020). (iii) Innovation: In response to climate change, banks must be creative in creating new offerings that support sustainability, such as green investment funds and energy-efficient mortgages (Deloitte, 2021).

A company's performance in relation to environmental sustainability, social responsibility, and corporate governance is assessed using a set of criteria known as ESG factors. ESG considerations are becoming more and more significant in the banking industry as stakeholders' investors, clients, and regulators place a higher value on sustainability and moral business conduct. Environmental Factors: These factors centre on how a bank uses natural resources, how much carbon it emits, and what steps it takes to slow down climate change. By implementing sustainable practices, such as lowering energy consumption, assisting with renewable energy projects, and funding green initiatives, banks can integrate environmental considerations into their daily operations (UNEP FI, 2018).

Social Factors: A bank's treatment of its staff, clients, and the communities in which it operates all have an impact on society. Banks can tackle social factors through various means, such as advocating for diversity and inclusivity, endorsing community development initiatives, and providing responsible lending practices that assist marginalized communities (World Bank, 2019). Governance Factors: A bank's leadership structure, risk management procedures, and transparency are all examples of how it is managed and governed. Robust governance protocols have the potential to foster stakeholder trust in banks and reduce the likelihood of fraudulent activities, corruption, and unethical conduct (OECD, 2015).

Banking operations can be made more risk-averse, more reputable, and more appealing to socially conscious investors by incorporating ESG considerations. Furthermore, banks can support sustainable development and the accomplishment of international environmental and social goals by integrating ESG principles into their operations (UNEP FI, 2018). Because they direct banks' actions and decisions to support sustainability, moral behaviour, and long-term value creation, ESG factors are extremely important to the banking industry.

Several studies have explored the relationship between climate change and bank performance, focusing on the risks and opportunities that climate change presents to the banking sector. Climate Change Risks: Research has emphasized the range of risks that climate change presents to banks, including liability risks (such as lawsuits pertaining to climate change effects), transition risks (such as changes in regulations affecting investments in fossil fuels), and physical risks (such as damage to assets from extreme weather events) (UNEP FI, 2020). Financial Impacts: Studies have also looked at how climate change will affect banks financially. These studies have looked at the possibility of higher loan default rates because of climate-related disasters, as well as the chances that banks will be able to create new services and products in response to climate change (KPMG, 2021).

Research has also looked at the regulatory environment surrounding climate change. Risk Management Practices: Research has shown how critical it is to incorporate risk related to climate change into banks' risk management procedures. This includes conducting stress tests to identify potential risks and creating plans to reduce those risks (CERES, 2019). Research has also looked at the regulatory environment surrounding climate change and how it affects banks. Some of the issues that have been covered include the requirement that banks reveal the risks they face from climate change and the possibility of changes to the law that would encourage banks to invest in sustainable practices (Deloitte, 2020).

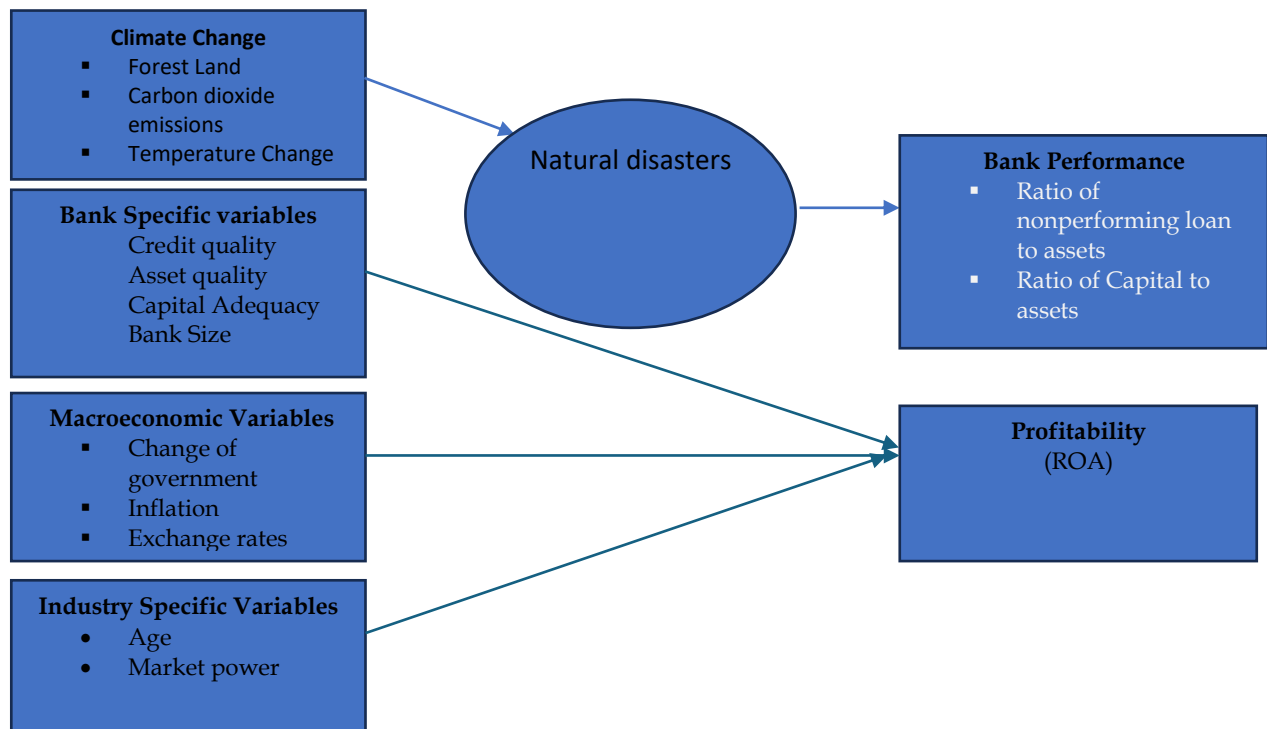
These studies shed important light on the opportunities and difficulties that the banking industry faces because of climate change, emphasizing the necessity for banks to create strong plans to manage risks associated with the issue and take advantage of new opportunities. Although prior research has offered insightful information regarding the connection between climate change and bank performance, this study aims to fill in a few gaps that are key. The previous studies had restricted attention to developing nations, much of the research on bank performance and climate change that has been done so far has concentrated on developed nations. Further studies are required in developing nations because they may be more vulnerable to the effects of climate change and may present difficulties for banks (Fankhauser et al., 2019). This study will focus on developing countries specifically South Africa with a mission to address this gap in the existing body of knowledge.

While some research has looked at how regulators and investor's view climate change and bank performance, little is known about how other stakeholders, like customers and bank executives, feel about it. By investigating bank executives' knowledge and perception of climate change risks in South Africa, this study seeks to close this gap (Bank of England, 2019). Taking care of these gaps in the literature will help us comprehend climate change's effects on bank performance more thoroughly, especially when it comes to developing nations like South Africa. The study will seek to examine the impact of climate change on banks performance in South Africa. Tersely, the study intends to examine the financial implications of climate change-related risks on the profitability, stability, and resilience of banks in South Africa

There are various reasons why the study on how climate change affects South African bank performance is important. By concentrating on an area that has not gotten much attention in earlier studies, it fills a significant void in the body of literature. This is significant because, due to its reliance on natural resources and agriculture, as well as its vulnerability to extreme weather events, South Africa, like many other developing nations, is especially vulnerable to the effects of climate change. The study has applications for South Africa's banking industry. Banks looking to improve their resilience and sustainability practices can benefit greatly from the study's examination of the approaches and procedures taken by banks to manage risks associated with climate change and seize opportunities for sustainable growth. This can assist South African banks in better positioning themselves for long-term success in a changing environment and preparing for the challenges presented by climate change.

Moreover, the research can provide valuable insights to South African policymakers and regulators regarding the unique obstacles and prospects that banks encounter concerning climate change. This can assist regulators in formulating laws and guidelines that support environmentally friendly banking practices and foster an atmosphere that makes it easier for banks to prosper in the face of climate change.

All things considered, the research on how climate change affects South African banks' performance is noteworthy because it can advance both academic understanding and real-world banking solutions. It may offer insightful information that banks and legislators need to successfully navigate the difficulties presented by climate change and move toward a more sustainable future.



Literature Review

The interconnectedness of climate change, macroeconomic dynamics, and bank performance has garnered increasing scholarly attention in recent years. The rising frequency and severity of climate-induced events, coupled with regulatory and societal pressures for sustainable finance, have made it imperative to understand the channels through which environmental risks affect banking operations and financial stability. This literature review synthesizes contemporary findings and theoretical advancements from various regions and methodological perspectives to delineate the contours of this relationship.

Climate Change and Bank Performance

Climate change presents both physical and transitional risks to financial institutions. Physical risks refer to direct damages caused by extreme weather events such as floods, droughts, and hurricanes, whereas transitional risks encompass the economic shifts stemming from the transition to a low-carbon economy (e.g., regulatory changes, technological shifts, and market sentiment).

Boungou (2023) provides empirical evidence that climate change-related risks negatively impact bank stock returns, suggesting that market participants factor in environmental vulnerabilities when valuing banking stocks. Similarly, Brik (2024) examines the effect of climate risk on financial stability in China, revealing a significant relationship between climate-induced shocks and non-performing loans (NPLs). These findings emphasize that banks exposed to regions or industries sensitive to climate volatility are more likely to experience credit risk deterioration.

Aguilar-Gomez et al. (2024) contribute by highlighting the relationship between thermal stress and firms' loan defaults in Mexico, where extreme temperatures increase default probabilities. These micro-level insights corroborate the notion that environmental conditions materially influence borrower creditworthiness and, by extension, bank asset quality.

Governance and Strategic Adaptation in Climate-Affected Banking

Corporate governance and strategic adaptation mechanisms play pivotal roles in mediating the adverse impacts of climate change on banks. Adu et al. (2024) argue that sound corporate governance can enhance a bank's climate resilience and financial performance, particularly when aligned with climate change initiatives. Their findings reveal that governance structures supporting sustainability efforts bolster investor confidence and operational robustness.

Afzal et al. (2024) analyze the effect of green technology adaptation and human capital in the European banking sector. The study shows that banks that invest in green technologies and upskill their workforce demonstrate superior financial outcomes and reduced climate exposure. This aligns with findings from Secinaro et al. (2020), who note that climate change mitigation policies, while initially costly, eventually enhance the corporate financial performance of European firms, highlighting a long-term value proposition in sustainability.

Climate Reputation and Loan Financing

Bank reputation in the context of climate responsiveness has emerged as a novel determinant of financial outcomes. Hrazdil et al. (2024) explore how a bank's climate reputation influences loan contracting, noting that borrowers perceive environmentally responsible banks as more credible and trustworthy, thereby reducing moral hazard and improving contract terms. In a complementary study, Choi, Gam, and Shin (2023) find that environmental reputation positively correlates with bank liquidity, particularly during periods of climate transition uncertainty.

The concept of climate reputation is further explored by Huang et al. (2022), who investigate how firms' climate risk management practices affect their bank loan financing. The study shows that proactive risk management leads to more favorable lending terms, implying a feedback loop wherein climate preparedness improves financial access, which in turn supports sustainability investments.

Climate Risks and Bank Profitability

Lee and Alam (2024) examine the impact of climate risks on bank profitability through the liquidity creation channel in G7 countries. Their empirical analysis demonstrates that increased climate risk

negatively affects banks' liquidity creation, thereby reducing profitability. This suggests that climate-related uncertainties strain banks' intermediation functions and impede their earnings capacity.

De Marco et al. (2023) offer further evidence of climate-induced profitability shifts through their analysis of El Niño's impact on U.S. banks. Their study finds that climate shocks adversely affect bank loan portfolios, provisioning behavior, and overall profitability, indicating that macro-level climate events translate into micro-level financial strain.

Regional Insights and Asymmetric Impacts

The regional context significantly moderates the relationship between climate change and bank performance. Amo-Bediako et al. (2024) investigate the asymmetric effects of climate change on banking system stability in selected Sub-Saharan economies. They find that climate events disproportionately affect banking systems in low-income countries due to weaker adaptive capacities, limited insurance coverage, and underdeveloped financial infrastructure.

Moyo and Wingard (2015) provide one of the earlier assessments of climate change impacts on South African companies, showing that environmental shocks lead to lower profitability and market valuation, indirectly affecting banks through corporate loan exposures. These findings reinforce the need for region-specific policy responses and risk mitigation strategies.

Nie, Regelin, and Wang (2023) extend the conversation by analyzing banking sector risk in the aftermath of environmental disasters. Their study concludes that climate-related disasters increase credit risk, operational disruptions, and capital adequacy concerns, especially in emerging markets.

The Role of Macroeconomic Variables

While the direct relationship between climate change and bank performance is critical, macroeconomic variables act as both mediators and moderators in this dynamic. Climate events influence macroeconomic indicators such as inflation, GDP growth, and unemployment, which in turn affect banking performance.

For instance, during climate-induced economic slowdowns, loan demand declines, defaults increase, and interest margins shrink. This creates a negative feedback loop between macroeconomic stress and banking stability. Studies like those by Im, Pesaran, and Shin (2003) offer econometric tools to analyze such panel-level dynamics, enabling researchers to disentangle heterogeneous effects across countries and time periods.

Bandyopadhyay and Kashyap (2023) apply such methodologies in their analysis of Indian firms, revealing that climate risk increases banks' credit exposure through deteriorating firm fundamentals, thus emphasizing the role of sector-specific vulnerabilities.

Integrative Framework and Future Directions

The extant literature provides robust evidence that climate change influences bank performance through multiple interconnected channels, including credit risk, liquidity constraints, profitability erosion, and reputational shifts. It also underscores the importance of macroeconomic conditions and institutional readiness in shaping the extent and direction of these impacts.

Despite the growing body of research, gaps remain. First, most empirical studies are region-specific, limiting generalizability. Second, climate risk modeling in banking remains in its infancy, necessitating the development of integrated assessment models that capture non-linear interactions between environmental, financial, and economic systems. Third, the role of regulatory frameworks, such as green taxonomies and climate stress testing, requires deeper exploration.

In conclusion, the relationship between climate change, macroeconomics, and bank performance is multifaceted and evolving. Future research should aim to build comprehensive, multi-country datasets, incorporate advanced econometric techniques, and consider the behavioral dimensions of climate finance. Only then can stakeholders—from policymakers to practitioners—craft resilient financial systems capable of withstanding the environmental upheavals of the 21st century.

Methodology

This study employs a quantitative research design to investigate the impact of macroeconomic and climate-related variables on financial performance indicators in the banking sector. The primary objective is to understand how variables such as GDP, repo rate, inflation, and proxies for climate change (e.g.,

temperature and precipitation) influence key profitability metrics: Return on Assets (ROA), Return on Equity (ROE), and Net Interest Margin (NIM).

Data Collection and Variables

Secondary time-series data were extracted for all variables under consideration. The dependent variables are:

- Return on Assets (ROA)
- Return on Equity (ROE)
- Net Interest Margin (NIM)

The independent variables encompass both economic and environmental indicators, including:

- Balance of Trade
- Consumer Price Index (Inflation Rate)
- Gross Domestic Product (GDP)
- GDP Growth Rate
- Precipitation Sum Average (PSA)
- Temperature at 2 meters (T2M)
- Real Effective Exchange Rate (REER)
- Repo Rate
- Unemployment Rate

Climate change variables such as PSA and T2M serve as proxies for environmental shocks, while traditional economic indicators help contextualize the macroeconomic environment.

Statistical Analysis and Assumptions

EViews software was used for the econometric modelling. Preliminary diagnostic tests were conducted to ensure the validity of the regression models. The Augmented Dickey-Fuller (ADF) test was applied to assess the stationarity of variables. The results showed that variables such as ROA, ROE, GDP, Repo Rate, CPI, PSA, T2M, and NIM were stationary at level $I(0)$. The unemployment Rate, REER, and Balance of Trade were stationary at first difference $I(1)$. This informed the transformation of some variables via differencing to ensure model consistency.

Multicollinearity was assessed and ruled out based on the Variance Inflation Factor (VIF) and correlation diagnostics. The results showed no perfect multicollinearity among the independent variables, affirming the robustness of coefficient estimates.

The Jarque-Bera test indicated that residuals were not normally distributed. However, since OLS regression does not require normally distributed residuals for unbiased estimators (only for efficiency), the models remain valid for inference.

Model Specification

Each dependent variable was modelled as a linear function of the economic and environmental predictors:

For example, the general form of the regression equation is:

$$Y = \beta_0 + \beta_1(\text{DBalanceofTrade}) + \beta_2(\text{CPI}) + \beta_3(\text{GDP}) + \beta_4(\text{GDPGrowthRate}) + \beta_5(\text{PSA}) + \beta_6(\text{DREER}) + \beta_7(\text{RepoRate}) + \beta_8(\text{T2M}) + \beta_9(\text{DUnemploymentRate}) + \varepsilon$$

Where Y is substituted by ROA, ROE, or NIM respectively in each model.

Each model was assessed for overall statistical significance using the F-statistic, and individual predictors were evaluated using t-statistics and p-values at the 5% significance level.

Data Analysis and Findings

Model 1: Return on Equity (ROE)

The regression model for ROE demonstrated strong statistical significance with an F-statistic of 7.097 and a p-value of 0.000000, indicating a reliable model for interpreting the influence of macroeconomic and climate variables on ROE.

Dependent Variable: ROE
Method: Panel Least Squares
Date: 09/02/24 Time: 11:34
Sample (adjusted): 2003Q2 2022Q4
Periods included: 79
Cross-sections included: 5
Total panel (balanced) observations: 395

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DBALANCEOFTRADE	2.57E-11	3.67E-11	0.702376	0.4829
CPI	0.112016	0.187376	0.597813	0.5503
GDP	0.660612	0.246414	2.680896	0.0077
GDPGROWTHRATE	-0.116826	0.187021	-0.624667	0.5326
PSA	-0.014040	0.013901	-1.010004	0.3131
DREER	-0.071446	0.046379	-1.540462	0.1243
REPORATE	0.698637	0.177840	3.928466	0.0001
T2M	-0.016291	0.055407	-0.294031	0.7689
DUNEMPLOYMENTRATE	0.148662	0.306248	0.485432	0.6276
C	-51.95399	23.70148	-2.192015	0.0290
R-squared	0.142300	Mean dependent var	18.69274	
Adjusted R-squared	0.122250	S.D. dependent var	6.195281	
S.E. of regression	5.804254	Akaike info criterion	6.380050	
Sum squared resid	12970.40	Schwarz criterion	6.480781	
Log likelihood	-1250.060	Hannan-Quinn criter.	6.419960	
F-statistic	7.097225	Durbin-Watson stat	0.129693	
Prob(F-statistic)	0.000000			

Gross Domestic Product (GDP) had a coefficient = 0.6606; p-value = 0.0077. A one-unit increase in GDP is associated with a 0.6606 increase in ROE. This finding aligns with conventional economic theory, suggesting that expanding economic output enhances corporate profitability.

Repo Rate had a coefficient = 0.6986; p-value = 0.0001. Higher repo rates significantly increase ROE, possibly due to improved returns on interest-bearing assets within banks' portfolios. Variables like GDP growth rate, precipitation, and temperature showed minimal influence on ROE, with p-values exceeding 0.05. These may affect financial performance indirectly or under specific conditions, suggesting non-linear or lagged effects.

Model 2: Net Interest Margin (NIM)

The NIM model was also statistically significant with an F-statistic of 4.19 and a p-value of 0.000035. This confirms that the included macroeconomic variables collectively explain variations in net interest margins.

Dependent Variable: NIM
Method: Panel Least Squares
Date: 09/02/24 Time: 11:38
Sample (adjusted): 2003Q2 2022Q4
Periods included: 79
Cross-sections included: 5
Total panel (balanced) observations: 395

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DBALANCEOFTRADE	-1.10E-10	1.67E-10	-0.658666	0.5105
CPI	-3.236945	0.852646	-3.796354	0.0002
GDP	-0.124516	1.121297	-0.111047	0.9116
GDPGROWTHRATE	0.788025	0.851031	0.925966	0.3550
PSA	0.039686	0.063254	0.627412	0.5308
DREER	-0.035237	0.211047	-0.166963	0.8675
REPORATE	3.845253	0.809250	4.751625	0.0000
T2M	-0.156650	0.252128	-0.621313	0.5348
DUNEMPLOYMENTRATE	-1.206342	1.393566	-0.865651	0.3872
C	16.26101	107.8524	0.150771	0.8802
R-squared	0.089219	Mean dependent var	11.35233	
Adjusted R-squared	0.067928	S.D. dependent var	27.35748	
S.E. of regression	26.41197	Akaike info criterion	9.410502	
Sum squared resid	268573.0	Schwarz criterion	9.511234	
Log likelihood	-1848.574	Hannan-Quinn criter.	9.450413	
F-statistic	4.190447	Durbin-Watson stat	0.029087	
Prob(F-statistic)	0.000035			

Repo Rate had a coefficient = 3.8452; p-value = 0.0000. A substantial positive effect implies that as the central bank increases the repo rate, banks benefit from higher interest spreads between loans and deposits. Consumer Price Index (CPI) had a Coefficient = -3.237. This large negative impact, though statistically significant, may reflect inflation-driven erosion of real returns. GDP unexpectedly negative coefficient (-0.1245), though its p-value suggests marginal significance. This might suggest that growth alone doesn't translate into wider interest spreads, possibly due to competitive lending or regulatory pressures.

Model 3: Return on Assets (ROA)

The ROA model, while statistically significant, had a lower explanatory power relative to ROE and NIM. Repo Rate had a coefficient = 0.2158; p-value = 0.0049. Suggests a positive and statistically significant relationship between repo rates and asset returns. Higher interest environments improve income from interest-generating assets. Variables like CPI, GDP, and PSA had relatively weak effects on ROA, indicating that profitability per asset may be less sensitive to environmental and general macroeconomic fluctuations than broader equity returns or interest margins.

Dependent Variable: ROA
Method: Panel Least Squares
Date: 09/02/24 Time: 11:41
Sample (adjusted): 2003Q2 2022Q4
Periods included: 79
Cross-sections included: 5
Total panel (balanced) observations: 395

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DBALANCEOFTRADE	8.08E-13	1.57E-11	0.051353	0.9591
CPI	-0.068391	0.080400	-0.850635	0.3955
GDP	0.037988	0.105732	0.359289	0.7196
GDPGROWTHRATE	0.017401	0.080248	0.216844	0.8284
PSA	-0.002932	0.005965	-0.491567	0.6233
DREER	-0.008133	0.019901	-0.408686	0.6830
REPORATE	0.215815	0.076308	2.828219	0.0049
T2M	-0.001969	0.023774	-0.082816	0.9340
DUNEMPLOYMENTRATE	-0.011543	0.131406	-0.087844	0.9300
C	-2.447470	10.16989	-0.240659	0.8099
R-squared	0.030486	Mean dependent var		2.361677
Adjusted R-squared	0.007822	S.D. dependent var		2.500301
S.E. of regression	2.490503	Akaike info criterion		4.687837
Sum squared resid	2388.002	Schwarz criterion		4.788568
Log likelihood	-915.8477	Hannan-Quinn criter.		4.727747
F-statistic	1.345149	Durbin-Watson stat		0.024484
Prob(F-statistic)	0.211751			

Across all models, the Repo Rate consistently emerged as the most influential and statistically significant predictor, underscoring its central role in shaping financial performance. Conversely, climate variables (PSA, T2M) showed limited immediate effects, perhaps due to their indirect and long-term nature. GDP exhibited divergent effects: strongly positive for ROE, negative for NIM, and marginal for ROA. This suggests that while economic growth enhances shareholder returns, it may not uniformly boost margins or asset profitability.

Conclusion and Recommendations

This research concludes that macroeconomic variables, particularly the Repo Rate and GDP, significantly influence the financial performance of banks. Among all predictors, the Repo Rate emerged as the most consistent and influential, enhancing ROA, ROE, and NIM.

- **Monetary Policy:** Central banks' policy rates are pivotal in banking profitability.
- **Strategic Financial Planning:** Banks should hedge against interest rate volatility and align portfolios accordingly.
- **Climate Awareness:** Though not immediately impactful, climate variables must be integrated into long-term risk assessments.

The linear nature of the model and the exclusion of non-linear or lagged effects may limit interpretations. Future studies should consider panel data, machine learning techniques, or non-linear models to capture complex interactions.

In conclusion, this study reinforces the critical role of macroeconomic policy and economic growth in determining banking sector health, with emerging attention to climate risks.

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Appendix

Preliminary Tests and Model Assumptions

1. Stationarity of Variables

1.1 ROA (Return on Assets)

Panel unit root test: Summary

Series: ROA

Date: 08/23/24 Time: 12:56

Sample: 2003Q1 2022Q4

Exogenous variables: Individual effects

User-specified lags: 2

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-1.85353	0.0319	5	385
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.04204	0.0012	5	385
ADF - Fisher Chi-square	25.6970	0.0042	5	385
PP - Fisher Chi-square	15.9464	0.1012	5	395

Return on Assets is stationary at level I(0)

1.2 ROE (Return on Equity)

Panel unit root test: Summary

Series: ROE

Date: 08/23/24 Time: 13:23

Sample: 2003Q1 2022Q4

Exogenous variables: Individual effects

User-specified lags: 2

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-1.67312	0.0472	5	385
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.46450	0.0069	5	385
ADF - Fisher Chi-square	21.4391	0.0182	5	385
PP - Fisher Chi-square	16.2870	0.0917	5	395

Return on Equity is stationary at level I(0)

1.3 T2M (Temperature at 2 meters)

Panel unit root test: Summary

Series: T2M

Date: 08/23/24 Time: 13:28

Sample: 2003Q1 2022Q4

Exogenous variables: Individual effects

User-specified lags: 2

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
<u>Null: Unit root (assumes common unit root process)</u>				
Levin, Lin & Chu t*	-13.1127	0.0000	5	385
<u>Null: Unit root (assumes individual unit root process)</u>				
Im, Pesaran and Shin W-stat	-31.3424	0.0000	5	385
ADF - Fisher Chi-square	92.1034	0.0000	5	385
PP - Fisher Chi-square	92.1034	0.0000	5	395

Temperature at 2 meters is stationary at level I(0)

1.4 Unemployment Rate

Panel unit root test: Summary

Series: D(UNEMPLOYMENTRATE)

Date: 08/23/24 Time: 13:55

Sample: 2003Q1 2022Q4

Exogenous variables: Individual effects

User-specified lags: 2

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
<u>Null: Unit root (assumes common unit root process)</u>				
Levin, Lin & Chu t*	-9.52442	0.0000	5	380
<u>Null: Unit root (assumes individual unit root process)</u>				
Im, Pesaran and Shin W-stat	-11.5313	0.0000	5	380
ADF - Fisher Chi-square	129.665	0.0000	5	380
PP - Fisher Chi-square	92.1034	0.0000	5	390

Unemployment rate is stationary at first difference I(1)

1.5 Repo Rate

Panel unit root test: Summary

Series: REPORATE

Date: 08/23/24 Time: 13:57

Sample: 2003Q1 2022Q4

Exogenous variables: Individual effects

User-specified lags: 2

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
<u>Null: Unit root (assumes common unit root process)</u>				
Levin, Lin & Chu t*	-0.32232	0.3736	5	385
<u>Null: Unit root (assumes individual unit root process)</u>				
Im, Pesaran and Shin W-stat	-2.28713	0.0111	5	385
ADF - Fisher Chi-square	19.2134	0.0376	5	385
PP - Fisher Chi-square	40.2777	0.0000	5	395

The Repo rate is stationary at level I(0)

1.6 REER

Panel unit root test: Summary

Series: D(REER)

Date: 08/23/24 Time: 14:05

Sample: 2003Q1 2022Q4

Exogenous variables: Individual effects

User-specified lags: 2

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
<u>Null: Unit root (assumes common unit root process)</u>				
Levin, Lin & Chu t*	-7.98154	0.0000	5	380
<u>Null: Unit root (assumes individual unit root process)</u>				
Im, Pesaran and Shin W-stat	-10.1912	0.0000	5	380
ADF - Fisher Chi-square	111.863	0.0000	5	380
PP - Fisher Chi-square	161.051	0.0000	5	390

The REER is stationary at first difference I(1)

1.7 Precipitation Sum Average (PSA)

Panel unit root test: Summary

Series: PSA

Date: 08/23/24 Time: 14:06

Sample: 2003Q1 2022Q4

Exogenous variables: Individual effects

User-specified lags: 2

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
<u>Null: Unit root (assumes common unit root process)</u>				
Levin, Lin & Chu t*	-2.19231	0.0142	5	385
<u>Null: Unit root (assumes individual unit root process)</u>				
Im, Pesaran and Shin W-stat	-5.96335	0.0000	5	385
ADF - Fisher Chi-square	55.2951	0.0000	5	385
PP - Fisher Chi-square	151.031	0.0000	5	395

PSA is stationary at level I(0)

1.8 Net Interest Margin (NIM)

Panel unit root test: Summary

Series: NIM

Date: 08/23/24 Time: 14:16

Sample: 2003Q1 2022Q4

Exogenous variables: Individual effects

User-specified lags: 2

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
<u>Null: Unit root (assumes common unit root process)</u>				
Levin, Lin & Chu t*	-3.02261	0.0013	5	385
<u>Null: Unit root (assumes individual unit root process)</u>				
Im, Pesaran and Shin W-stat	-4.06243	0.0000	5	385
ADF - Fisher Chi-square	37.1891	0.0001	5	385
PP - Fisher Chi-square	27.5280	0.0021	5	395

Net Interest Margin is stationary at level I(0)

1.9 Inflation Rate

Panel unit root test: Summary

Series: INFLATIONRATE

Date: 08/23/24 Time: 14:19

Sample: 2003Q1 2022Q4

Exogenous variables: Individual effects

User-specified lags: 2

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
<u>Null: Unit root (assumes common unit root process)</u>				
Levin, Lin & Chu t*	-0.66730	0.2523	5	385
<u>Null: Unit root (assumes individual unit root process)</u>				
Im, Pesaran and Shin W-stat	-5.16673	0.0000	5	385
ADF - Fisher Chi-square	46.1217	0.0000	5	385
PP - Fisher Chi-square	48.0687	0.0000	5	395

Inflation rate is stationary at level I(0)

1.10 GDP Growth Rate

Panel unit root test: Summary

Series: GDPGROWTHRATE

Date: 08/23/24 Time: 14:31

Sample: 2003Q1 2022Q4

Exogenous variables: Individual effects

User-specified lags: 2

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
<u>Null: Unit root (assumes common unit root process)</u>				
Levin, Lin & Chu t*	-7.34497	0.0000	5	385
<u>Null: Unit root (assumes individual unit root process)</u>				
Im, Pesaran and Shin W-stat	-12.5684	0.0000	5	385
ADF - Fisher Chi-square	142.318	0.0000	5	385
PP - Fisher Chi-square	92.1034	0.0000	5	395

GDP growth rate is stationary at level I(0)

1.11 GDP

Panel unit root test: Summary

Series: GDP

Date: 08/23/24 Time: 14:35

Sample: 2003Q1 2022Q4

Exogenous variables: Individual effects

User-specified lags: 2

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
<u>Null: Unit root (assumes common unit root process)</u>				
Levin, Lin & Chu t*	-3.82458	0.0001	5	385
<u>Null: Unit root (assumes individual unit root process)</u>				
Im, Pesaran and Shin W-stat	-4.81010	0.0000	5	385
ADF - Fisher Chi-square	42.2350	0.0000	5	385
PP - Fisher Chi-square	67.0055	0.0000	5	395

GDP is stationary at level I(0)

1.12 Balance of Trade

Panel unit root test: Summary
 Series: D(BALANCEOFTRADE)
 Date: 08/23/24 Time: 14:39
 Sample: 2003Q1 2022Q4
 Exogenous variables: Individual effects
 User-specified lags: 2
 Newey-West automatic bandwidth selection and Bartlett kernel
 Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-2.99463	0.0014	5	380
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-12.1640	0.0000	5	380
ADF - Fisher Chi-square	137.357	0.0000	5	380
PP - Fisher Chi-square	92.1034	0.0000	5	390

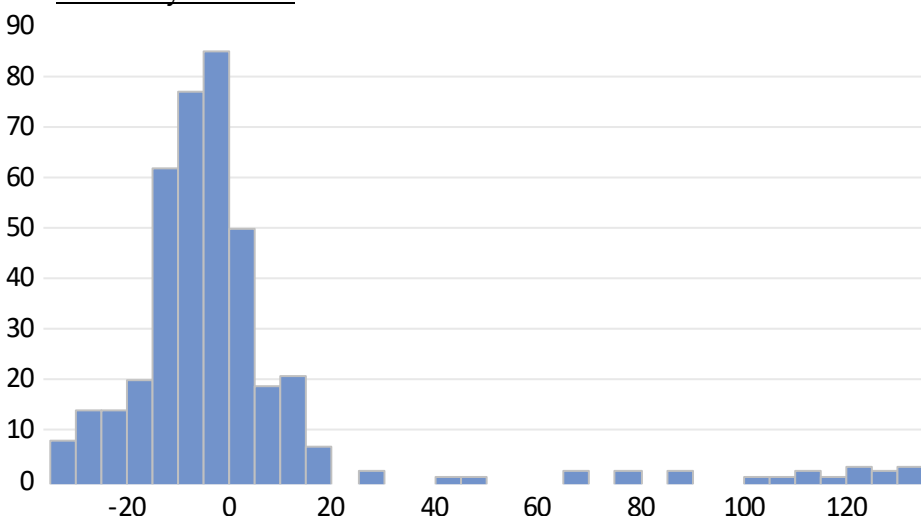
Balance of trade is stationary at first difference I(1)

2. No Perfect Multicollinearity

	ROE	T2M	UNEMPLOY...	ROA	REPORATE	REER	PSA	NIM	INFLATION...	GDPGROW...	GDP	BALANCEO...
ROE	1	-0.0135284...	-0.2908182...	0.32767044...	0.31452267...	0.02250141...	-0.0783382...	-0.0641043...	0.23662931...	0.01368875...	0.27661862...	-0.2979492...
T2M	-0.0135284...	1	0.00081489...	-0.0090403...	-0.0020164...	-0.0676344...	0.39246997...	-0.0173277...	-0.0055572...	0.08937182...	0.09966866...	0.04548135...
UNEM...	-0.2908182...	0.00081489...	1	-0.1256588...	-0.4340361...	-0.2404449...	0.15108322...	-0.1085848...	-0.1397606...	0.12223174...	-0.2239951...	0.65969524...
ROA	0.32767044...	-0.0090403...	-0.1256588...	1	0.16761058...	0.07180155...	-0.0314632...	0.81344909...	0.04759867...	0.01950936...	0.08135919...	-0.1279869...
REPO...	0.31452267...	-0.0020164...	-0.4340361...	0.16761058...	1	0.12011293...	-0.0588545...	0.18758340...	0.49637640...	0.03015330...	0.42910031...	-0.5424912...
REER	0.02250141...	-0.0676344...	-0.2404449...	0.07180155...	0.12011293...	1	0.07267224...	0.18213265...	-0.3427739...	0.17096569...	0.10606632...	-0.1986674...
PSA	-0.0783382...	0.39246997...	0.15108322...	-0.0314632...	-0.0588545...	0.07267224...	1	0.03221501...	-0.0531706...	0.12849329...	0.01866850...	0.06651653...
NIM	-0.0641043...	-0.0173277...	-0.1085848...	0.81344909...	0.18758340...	0.18213265...	0.03221501...	1	-0.0976156...	0.04875728...	0.02891776...	-0.1375235...
INFLAT...	0.23662931...	-0.0055572...	-0.1397606...	0.04759867...	0.49637640...	-0.3427739...	-0.0531706...	-0.0976156...	1	-0.0239827...	0.45917804...	-0.2250239...
GDPG...	0.01368875...	0.08937182...	0.12223174...	0.01950936...	0.03015330...	0.17096569...	0.12849329...	0.04875728...	-0.0239827...	1	0.38707721...	-0.1052611...
GDP	0.27661862...	0.09966866...	-0.2239951...	0.08135919...	0.42910031...	0.10606632...	0.01866850...	0.02891776...	0.45917804...	0.38707721...	1	-0.5821023...
BALAN...	-0.2979492...	0.04548135...	0.65969524...	-0.1279869...	-0.5424912...	-0.1986674...	0.06651653...	-0.1375235...	-0.2250239...	-0.1052611...	-0.5821023...	1

After running a multicollinearity test, we figured out that among the explanatory variables we do not have variables that suffer from multicollinearity meaning the chances of having instability in the coefficient estimates is reduced.

3. Normality of Errors



Series: RESID	
Sample 2003Q1 2022Q4	
Observations 400	
Mean	-7.21e-15
Median	-4.826155
Maximum	133.9623
Minimum	-32.96164
Std. Dev.	26.65884
Skewness	3.356717
Kurtosis	15.39812
Jarque-Bera	3313.061
Probability	0.000000

The Jarque Bera P value is less than 5% meaning we reject the null hypothesis meaning the residuals are not normally distributed. The normality of residuals is not strictly necessary for sufficient estimates to be unbiased.

Impact of Economic Status on Perceived Buying Intention of University Professors towards the Energy Efficient Appliances in India

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Keywords

Energy Efficient Appliances, Green Behaviour, Green Skepticism, Green Product Paradox, PLS-SEM, Economic Status, Attitude

Abstract

This study investigates the nuanced interplay between economic status and perceived buying intention toward energy-efficient appliances among university professors in India, a demographic characterized by high educational attainment and environmental awareness. Grounded in the Theory of Planned Behaviour (TPB), the research extends the traditional framework by integrating environmental concern and environmental knowledge as responsible for shaping consumers' attitude, and by testing economic status as a moderating variable. Using a cross-sectional design and data from 300 respondents employed in higher education institutions, the study applies Partial Least Squares Structural Equation Modelling (PLS-SEM) to evaluate the strength and significance of relationships among constructs.

Contrary to conventional economic theory, the findings reveal that economic status does not significantly influence purchase intention, challenging the assumption that affordability is a primary barrier to green consumption. Instead, environmental concern and environmental knowledge emerge as dominant predictors of consumer attitude, which in turn strongly drives purchase intention ($\beta = 0.694$, $p < 0.001$). The moderation analysis further confirms that the interaction between economic status and attitude has an insignificant effect on purchase intention ($\beta = -0.026$, $p = 0.864$), suggesting that intrinsic motivation and environmental consciousness override the income-based constraints in this context.

The study also uncovers that subjective norms and eco-label knowledge do not significantly shape consumer attitude, hinting at a latent skepticism or limited trust in external cues such as labelling and peer influence. This finding diverges from prior literature and raises questions about the efficacy of green marketing and labelling strategies in influencing educated consumers. Reliability and validity metrics – including high Cronbach's alpha, AVE, and HTMT ratios – affirm the robustness of the measurement model, while R^2 values indicate that attitude explains nearly 60% of the variance in purchase intention.

Practically, the research underscores the importance of fostering environmental knowledge and concern through targeted educational and policy interventions, rather than relying solely on economic incentives or labelling schemes. The results advocate for a shift in marketing and policy focus, from price subsidies to awareness campaigns and moral framing, to enhance adoption of energy-efficient technologies. The study also calls for a re-evaluation of demand-side assumptions in sustainability discourse, especially in contexts where consumers exhibit high intrinsic motivation.

By isolating economic status as a non-significant moderator, this work contributes a critical perspective to the green consumer behavior literature and opens avenues for future research on behavioral segmentation, longitudinal analysis, and alternative indicators of economic capacity. It also offers actionable insights for policymakers and marketers aiming to accelerate India's transition toward sustainable consumption, particularly within the educated and environmentally conscious segments of society.

Introduction

The energy utilization especially in urban areas is very high compared to its rural counterparts, primarily due to high population density. However, the inadequate supply of energy and the excessive demand sometimes create a mismatch between these two market forces, and to bridge this gap, excessive pressure has to be put on natural resources (Li et al. 2019). In this case, the use of energy-efficient electronic appliances can help reduce the pressure on non-renewable natural resources, but the prices of the energy-efficient products are comparatively much higher than the less energy-efficient products (Barbarossa & Pastore, 2015; Nguyen et al. 2014).

This behaviour is also termed as green product paradox (Longoni et al. 2014). Motivation at a broader level can help shape the buying behavior of the masses (Gogil and Gigol, 2022), initiatives like subsidies given by the governments to some extent can help give a head start, but its impact is not long-lasting (Li et al. 2019). The consumers' green trust is also affected by negative experiences, the condition when consumers' perception of a green product turns out to be wrong, it is known as greenwashing and leads to green skepticism (Gigol and Gigol, 2022). A green product is defined based on its properties involving natural ingredients, grown originally, recyclable, reusable, chemical-free, pollution-less, and not tested on animals (Mishra & Sharma, 2010). The most commonly used indicator laid by the United Nations i.e. 3R; is Reduce, Reuse, and Recycle. (Janssen & Jager, 2002) has defined green products as "products that are less harmful to the environment and promote social well-being and having a superiority over traditional products".

Having said that, several factors determine consumer behaviour towards energy-efficient appliances. As per the Theory of Planned Behaviour (TPB), the attitude of the consumer is constituted by the Behavioural aspect, Effective aspect, and Cognitive aspect (Blum and Naylor, 1968). The theory of planned behaviour takes into account the psychological aspect of a consumer's behaviour but does not deal with the economic aspect i.e. economic status of the consumer. So, how important a consumer's economic status is when it comes to the pro-environmental consumption decision?

Literature review

The sustainability that is defined in its broadest form by the sustainable development goals (SDG, 2016) highlights the need for responsible consumption and production (12th Goal of SDG), and climate action (13th Goal of SDG). It suggests more sensible buying that causes no or least damage to the environment. Although, the sustainability goals ask for a transition in economies in terms of energy production, but still in most of the developing nations energy is being produced from non-renewable natural resources such as coal (Hossain et al., 2022). Studies have suggested ways in which energy can be saved and conserved so that there is less pressure on the resources and ultimately contributing to saving the environment (Li et. al, 2019; Hossain et. al, 2022; Safarzynska et. al, 2011). In this regard, economies across the world are shifting to non-conventional sources of energy such as solar energy, wind energy, and nuclear energy as well. However, the cost involved is one of the major impediments in this particular transition.

Countries are exploring new sources of energy, and the United Kingdom serves as an example, as it continues to research on nuclear energy, but the market for nuclear and non-conventional energy *per se* is limited, specifically from the investors' point of view, so by avoiding the higher cost of transition the investors are persistent with the use of coal for electricity generation (Safarzynska et. al, 2011). On the contrary, Bangladesh is investing in fossil fuels for electricity generation, which is not a sustainable practice, but the cost associated with transitioning to renewable energy persistently forces Bangladesh to continue investing in fossil fuels (Hossain et. al, 2022). So economies with limited resources and less renewable energy potential can aim for energy conservation by promoting the consumption of energy-efficient products (Luthra and Deshwal, 2022; Li et. al, 2019). However, it is very difficult to understand the consumer's behaviour, especially towards energy-efficient electronic appliances which are beneficial in the long run, but cost higher at the time of purchase, along with the price component many factors determine consumer's willingness to purchase energy-efficient appliances including the psychological factors like environmental knowledge and environment concern (Zhang et. al, 2022; Hossain et. al, 2022; Gigol and Gigol, 2022; Li et. al, 2021; Taufique and Vaithainathan, 2018).

The factors that affect the consumers' willingness to purchase energy-efficient appliances can be understood by taking the theory of planned behavior as a base (Hossain et. al, 2022; Li et. al, 2021; Li et. al, 2019). Environmental knowledge is treated as the important factor that shapes the consumers' behavior to

purchase energy-efficient appliances. The studies have used environmental knowledge and environmental concern as the mediating factors that shape consumers' behavior in this regard (Hossain et. al, 2022; Zhang et. al, 2022; Kinelski et. al, 2022). Environmental concern is an outcome of environmental knowledge, however, environmental awareness can be advertised on various platforms including social media which can help develop environmental concern among the masses (Kinelski et. al, 2022). Environmental knowledge is detrimental to environmental concern, however, attitude, green trust, and eco-labels work as mediators in shaping pro-environmental behavior (PEB) (Hossain et. al, 2022). In light of the theory of planned behavior and consumers' willingness to purchase energy-efficient home appliances, the ethnic norms (Tan, 2013), Price (Wang et. al, 2018), Environmental knowledge, and Environmental concerns are detrimental (Hossain et. al, 2022).

In China, household electric energy consumption increased by 468 billion kWh from 2005 to 2015, an increase of 162%. Carbon emissions increased by 5.8% from 2014 to 2015, and household carbon emissions accounted for 11.6% of the total domestic carbon emissions, where about 70% of household carbon emissions are produced by household appliances (Li et. al, 2019). Households are thus, the major prospects for energy conservation, the factors that govern the buying decision of the energy-efficient appliance depend on many factors such as income, price, environmental knowledge, and concern, etc. however, in some studies, the role of subsidies has been highlighted, but the impact of subsidies on consumers' decision is not long term and thus cannot be taken as determining factor in this case (Li et. al, 2019). In a nutshell, the issue of energy conservation, environment protection, and reduction of carbon footprint, all require effort toward the same goal of a sustainable future, by cutting on the use of conventional sources of energy generation and much-needed transition to modern or non-conventional sources of energy such as Solar Energy and Green hydrogen, etc.

Research Gap

The literature provides a rich theoretical base for the Theory of Planned Behaviour (TPB). However, most of the studies have used the TPB model with slight changes in it. In this specific work, the researcher added environmental concern and environmental knowledge and analysed its mediating effect on attitude and also showed the direct impact of environmental knowledge and environmental concern on willingness to purchase energy-efficient appliances (Li et. al, 2019). In a similar study, environmental knowledge and eco-label knowledge were used as mediating variables that determined attitude and green trust and also captured the direct impact on pro-environmental behaviour (Hossain et. al, 2022). Another work showed how environmental concern and environmental knowledge shape attitude along with subjective norms and perceived behavioural control (PCB) and ultimately determines the purchase intention of the consumer (Yadav and Pathak, 2016). Similarly, the attitude towards the environment along with subjective norms and perceived consumer effectiveness shapes the behavioural intention of the consumer and ultimately determines ecologically conscious consumer behaviour (Taufique and Vaithianathan, 2018).

It is apparent that the majority of the studies have incorporated environmental knowledge and concern as mediating variables that shape consumers' attitude that ultimately determines the willingness to purchase energy-efficient appliances, however, there is no such study where exclusively the influence of economic factors were focused. Income plays a detrimental role in determining the consumer's expenditure, theories from the fundamental Psychological law of consumption of J. M. Keynes (1936) to the Absolute Income Hypothesis of J. R. Hicks (Theory of Value and Capital, 1936) and the Life Cycle Hypothesis of Franco Modigliani (1966). Psychological factors like attitude and purchase intention are relevant, but the mere desire cannot be treated as a demand until a basic condition of willingness and capability to pay for the product is not met.

Environmental factors can shape the consumers' attitudes and can motivate a person to develop pro-environmental behaviour along with the knowledge of eco-labels that helps in developing green trust towards the products and companies at the border level (Hossain et. al, 2022; Li et. al, 2019; Taufique and Vaithianathan, 2016). Surprisingly, all the studies have talked about the non-income factors that motivate a person to develop pro-environmental, but mere environmental knowledge cannot convert the desire to buy an energy-efficient appliance into demand, for demand, there is a requirement of necessary purchasing power. So, it all comes down to a consumer's purchasing power and environmental knowledge and environmental concern that can best determine the Pro-environmental behaviour of a consumer.

Theoretical Underpinnings

The model uses four independent variables; subjective norms, Environment knowledge, Environment concern, and eco-label knowledge. These independent variables form a higher-order construct i.e. attitude. However, the study also establishes that apart from the cognitive, affective, and behavioral aspects of attitude, the economic status of the consumers also determines the purchase intention. The study uses the economic status of the consumers as a moderator that affects the influence of attitude on purchase intention.

Figure_1 represents the theoretical model representing the subjective norms, environment knowledge, environment concern, and eco-label knowledge as the independent variables, attitude as a higher-order construct, economic status as the moderator, and purchase intention as the dependent variable. The model explains the route assigned for the accomplishment of the proposed analysis and in this regard, the researcher would: - 1. Examine the socio-economic profile of the respondents, 2. Analyze the impact of

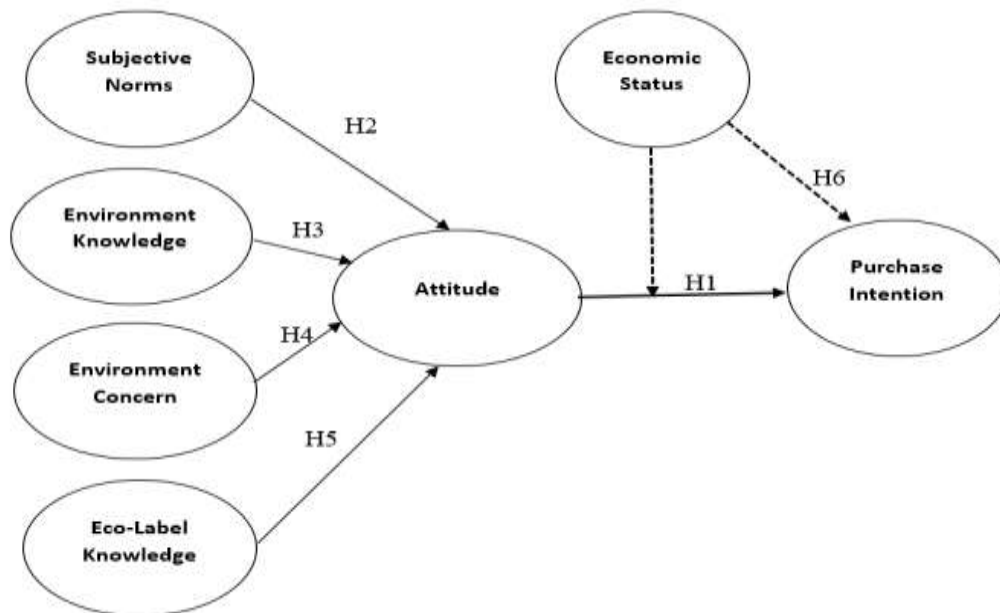


Figure 1 Theoretical Model of Green Behaviour of University Professors towards Energy Efficient Appliances

individual exogenous variables on the consumer's attitude, 3. Examine the significance of attitude in determining the purchase intention of the consumer, and 4. Examine the significance of consumers' economic status in determining the purchase intention of the consumers.

Research Methodology

The study follows a cross-sectional study design and uses primary data, collected with the help of a questionnaire formed as a Google form. The respondent were individuals working at the higher education level viz; College/University (both Government and Private). The researcher collected data from 300 respondents, through various means such as emails, LinkedIn posts, Social Media surveys etc. It is a contemporary research work and attempts to generate practical knowledge regarding the consumer's behaviour towards energy-efficient appliances.

Data Analysis Technique

The study applied Partial Least Squares - Structural Equation Modelling (PLS-SEM) as a second-generation data analysis technique (Hair et al, 2021). The author however used *SmartPLS-4.9.1* software to perform SEM-PLS (Hair et al, 2021).

Socio-Economic Profile of the sample population*Source: Author's Computation.***Table 1 Socio-Economic Profile of the Sample Population**

Background Characteristics	Sub-category	Coun t	Percent
Gender of the respondent	Male	195	65.00
	Female	105	35.00
Qualification of the respondent	BA/BSc	30	10.00
	MA/MSc	89	29.67
	Professional Degree	53	17.67
	PHD	128	42.67
Income Taxpayer	Yes	184	61.33
	No	116	38.67
Employment status	Government Job	71	23.66
	Private Job	229	76.34
Income slab	0-2.5 lac	69	23.00
	2.5 lac - 5 lac	83	27.67
	5 lac - 10 lac	79	26.33
	10 lac above	69	23.00

Table 1 represents the socioeconomic profile of the sample population. The study collected data from 300 respondents working in a higher education institution. Out of the total sample population, 65 percent are males and 35 percent are female. As per the qualification, the majority of the sample population has a Ph.D. in various disciplines, while only 10 percent sample population has an undergraduate degree. This can be used as a piece of evidence that the sample population is well-educated and well-informed as all the respondents are College graduate and are working in the higher education sector. The majority of the sample population pays income tax, which indicates better economic status. As far as employment status is concerned, the majority are working in private institutions (Private Universities or Colleges). The majority of the sample population earns more than 0.5 million in a year.

The present work is based on a sub-strata of the population, contrary to the studies that used the general population for analysis. The primary reason for the selection of a target audience is to provide specific findings for the people in the working age group, who are well aware of the importance of the environment as they are working in an academic setup (university/college) since the focus of the present investigation is restricted to the working population on the contrary to the available literature where researchers have used population i.e above 18 years (Zhang, 2022). However, for the present case, this does not qualify as the appropriate age group as at 18 years an individual will not be able to get employment in an academic setup.

In a nutshell, the sample represents the characteristics of a well-educated, well-informed, economically well-off population. Although it is a targeted study of the people working in the higher education sector and their behaviour towards energy-efficient appliances, as far as the present work is concerned, the sample is the best fit.

Data Analysis and Discussion

The section represents the analysis of the sample data and the useful inferences about consumer behaviour towards energy-efficient appliances. The collected data were coded to simplify the analysis, the coding was done in SPSS package. The construct attitude was coded as ATT, and the items were coded as ATT1, ATT2, ATT3, and ATT4 representing the items that constitute consumers' attitudes. Similarly, Subjective Norms were coded as SN and the items from SN1 to SN7, environment concern as EC and the items as EC1 to EC7, eco-label knowledge as ELK and items as ELK1 to ELK3, environment knowledge as EK and items as EK1 to EK7, and purchase intention as PI with items coded as PI1 to PI3. The smart PLS-4

was used to analyze the collected data of 300 working employees in higher education departments such as universities and colleges.

The overall reliability of the constructs ranges between 0.898 and 0.957, showing that the composite reliability (CR) is very high. The Average Variance Extracted (AVE) ranges between 0.688 and 0.957 indicating that the convergent validity in the present case is higher and more than 68 percent variation is explained by the construct. The present study also used the Heterotrait-Monotrait Ratio (HTMT) to measure the convergent/scale validity, and the values are well below 0.85 which indicates greater scale validity. The results are further explained in the table 2 to 7. Table 5 shows the R-square values for the dependent variable which is purchase intention for energy-efficient appliances, and the higher order construct i.e. Attitude. The observed R-square and adjusted R-Square values were 0.597 and 0.591 respectively, which indicate a good model fit and also explain the effect of attitude on the purchase intention of the consumers for energy-efficient appliances.

Table 2. Distribution of Factor Loadings, Reliability, AVE, and Composite Reliability Values Based on Measurement Model Analysis

Constructs	Items	Factor Loadings	Cronbach's alpha	AVE	CR
Attitude	A1	0.752	0.849	0.688	0.898
	A2	0.852			
	A3	0.849			
	A4	0.860			
Environment Concern	EC1	0.844	0.926	0.771	0.944
	EC2	0.922			
	EC3	0.901			
	EC4	0.884			
	EC7	0.837			
Environment Knowledge	EK1	0.818	0.943	0.713	0.943
	EK2	0.817			
	EK3	0.762			
	EK4	0.810			
	EK5	0.858			
	EK6	0.903			
	EK7	0.898			
Eco-label Knowledge	ELK1	0.946	0.932	0.880	0.957
	ELK2	0.933			
	ELK3	0.935			
Purchase Intention	PI1	0.844	0.870	0.794	0.920
	PI2	0.910			
	PI3	0.917			
Subjective Norms	SN1	0.903	0.940	0.802	0.953
	SN2	0.870			
	SN3	0.917			
	SN5	0.930			
	SN7	0.853			

Source: Author's Computation.

Table 2 shows that the factor loading of all the items of the latent variable is above 0.75 and as a result, the correlation between the corresponding indicators and latent variables is very high. The individual indicators capture the phenomenon to more than 75 percent. The Cronbach's alpha is above 0.7 and supports the claim of high correlation among the corresponding items of the concerned latent variables. The high

value of Cronbach's alpha is an indication of higher internal consistency. The Average Variance Extracted (AVE) is also above 0.5 and explains that more than 50 percent of the variation is explained by the indicators for the corresponding latent variables. The composite reliability is also well above 0.85 and explains higher overall reliability.

Table 3 Heterotrait - Monotrait Ratio (HTMT) – Matrix of Constructs

	ATT	ELK	EC	EK	PI	SN
ATT		0.662	0.662	0.574	0.769	0.133
ELK	0.662		0.760	0.584	0.812	0.136
EC	0.662	0.760		0.526	0.778	0.097
EK	0.574	0.584	0.526		0.618	0.473
PI	0.769	0.812	0.778	0.618		0.26
SN	0.133	0.136	0.097	0.473	0.26	

Source: Author Computation

Table 3 represents that the matrix of the HTMT ratio has all the values below 0.85, which is an indication of discriminant validity. The values confirm that the constructs are not correlated to each other and are distinct and unique. It is also an indication of the scale validity that the instrument used for collecting responses uses appropriate items and constructs, hence ensuring higher internal consistency of the measurement model.

Table 4 Distribution of Collinearity Statistics (VIF) based on Items

Items	VIF
A1	1.736
A2	2.255
A3	2.014
A4	2.096
EC1	2.395
EC2	4.262
EC3	3.477
EC4	3.016
EC7	2.412
EK1	2.177
EK2	2.708
EK3	2.350
EK4	2.814
EK5	3.549
EK6	4.303
EK7	4.156
ELK1	4.090
ELK2	3.591
ELK3	3.901
PI1	1.963
PI2	2.545
PI3	2.782
SN1	3.753
SN2	3.452

SN3	4.307
SN5	3.709
SN7	2.867

Source: Author's Computation

Table 4 represents that there is no high collinearity among the indicators and all the VIF values are below 5 representing moderate multicollinearity, which implies that there is a presence of slight multicollinearity among the items that captures different phenomena, but still not problematic. As there is no case of severe multicollinearity ($VIF < 5$), the model can be further analyzed for inferences (**reference indicating moderate multicollinearity**).

Table 5 Distribution of R Square values of Dependent variable and Independent Variable

Independent and Dependent Variable	R-square	R-square adjusted
Attitude	0.5969	0.5914
Purchase Intention	0.4592	0.4574

Source: Author's Computation

Table 5 represents the R-square values of purchase intention (dependent variable), and attitude (independent variable/ higher-order construct). The values represent a high value of the coefficient of determination for both the Higher-order construct (independent variable) and dependent variable.

Table 6 (Direct Relationship) Path Coefficients: Mean, STDEV, T values, P Values

Construct Relationship	beta	stdev	t value	p-value	2.5%	97.5%
ATT -> PI	0.694	0.143	6.221	0.000	0.438	0.863
ENV Concern -> Attitude	0.597	0.055	10.716	0.000	0.478	0.697
ENV Knowledge -> Attitude	0.229	0.038	6.091	0.000	0.149	0.297
Eco Label Knowledge -> ATT	0.055	0.740	0.074	0.460	-0.088	0.202
Economic Status -> PI	-0.030	0.338	0.089	0.735	-0.211	0.144
Subjective Norms -> ATT	-0.037	0.821	0.045	0.412	-0.122	0.056

Source: Author's Computation

Table 6 represents the path coefficients/slope coefficients, sample mean, standard deviation, t values, and p values. The beta coefficient value of attitude and purchase intention is 0.694 which implies a strong causal relationship, with a t-value of 6.221, and a p-value of 0.000 indicating that the value is highly significant. Similarly, the beta value of environment concern and attitude has a t-value of 10.716 and a p-value of 0.000 representing the value is highly significant. The environment knowledge and its direct relationship with the dependent variable is also significant with a t-value of 6.091 and a p-value of 0.000. On the contrary, the relationship shared by eco-label knowledge, subjective norms, and economic status on purchase intention was found insignificant.

In a nutshell, environmental concern, and environmental knowledge are the major determinant of attitude, and attitude further affects the Purchase Intention. The complete model estimates are represented in Figure 2.

Table 7 Moderation relationship: mean, stdev, t values, p Values

Interaction Variables	beta	Stdev	t-value	p-values	2.5%	97.5%
ES x ATT -> PI	-0.026	0.151	0.171	0.864	-0.293	0.297

Source: Author's Computation

Table 7 represents the moderation analysis, and the sample mean, standard deviation, t-values, and p values. The interaction term economic status (ES) x attitude (ATT) -> purchase intention (PI) and its relationship is insignificant with a t-value of 0.171 and a P value of 0.864 that is above 0.05. In a nutshell, environmental concern and environmental knowledge positively affect the attitude of the consumer and attitude determines the purchase intention of the consumers toward energy-efficient appliances. Notably, the economic status has an insignificant impact on the consumer's decision making which goes against the law of demand that states the product with a higher price will be less desired by the consumers, but in the present case, the economic status of the consumer has no significant impact on the consumers' psychology as

the consumers across income groups reveal the same preference i.e. to go for the purchase of the energy-efficient appliance, irrespective of economic status.

In a nutshell, the consumers are well aware of the benefits of energy-efficient appliances and are willing to pay higher prices as economic status negatively affects the consumers' attitude, but the impact is insignificant.

Moderation Analysis

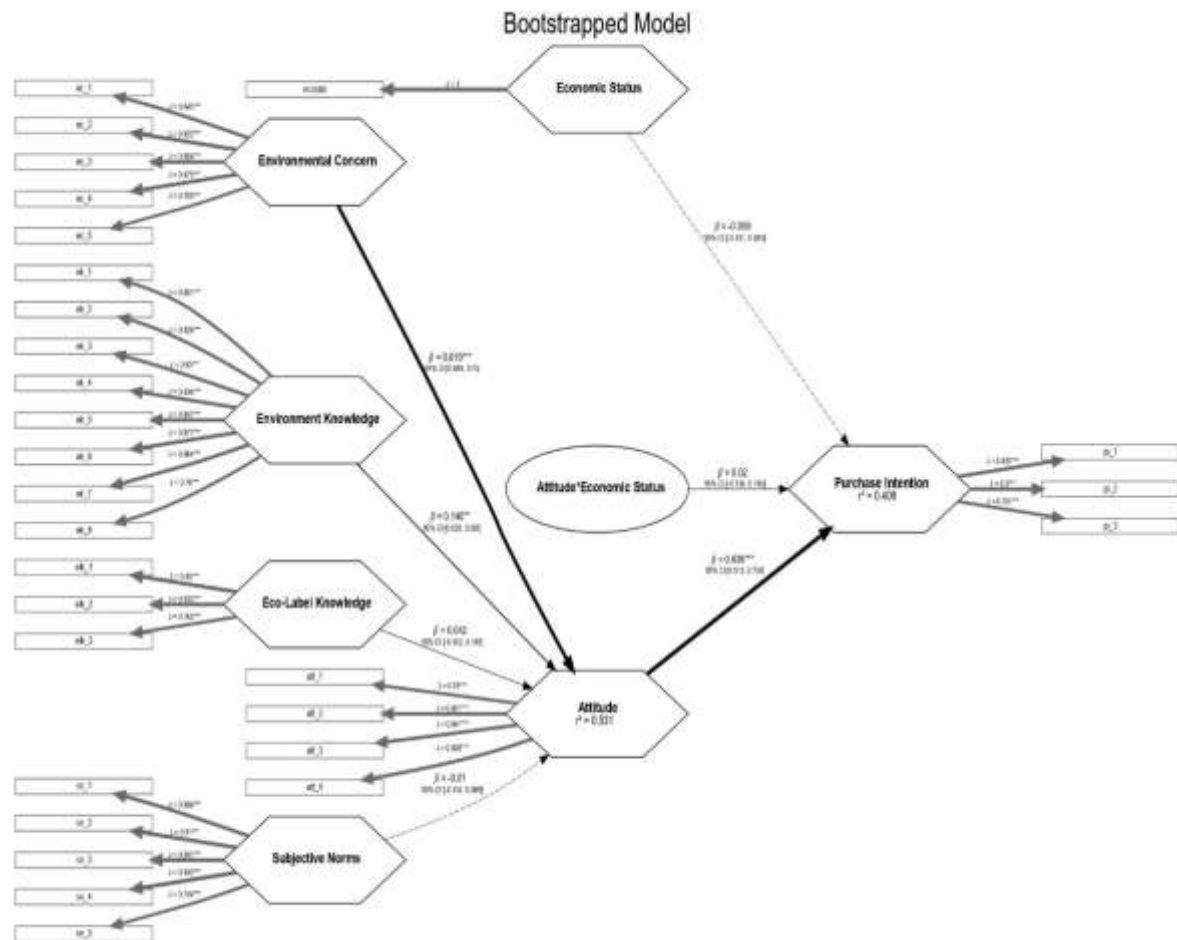


Figure 2 Structural Model of Consumer Behaviour towards Energy Efficient Appliances

The figure_2 represents the structural model with all the measured values. The constructs of Subjective norms, environmental knowledge, environmental concern, and Eco-label knowledge are the exogenous variables (independent). Attitude is the higher-order construct that constitutes SN, EK, ELK, and EC that further affects the value of the dependent variable i.e. purchase intention. The economic status of the consumers is the moderator that moderates the effect of attitude on purchase intention. The arrows going from the independent variables to their corresponding items (indicators) indicate that these are reflective constructs. The values represented by the arrows, stand for factor loading and since all the values are above 0.7 represent a very high correlation between the indicators, in other words, the items collectively measure the same phenomenon. Similarly, the arrows going from the independent variables to the higher order construct (attitude) represent the path values or beta coefficients, for its significance the author calculated the t-value and p-value and found that environment knowledge and environment concern have a significant

relationship with attitude, while subjective norms and eco-label knowledge have no significant relationship with attitude.

Attitude is the higher-order construct and the economic status of the consumer is the moderator that, in the present case, works as a constraint that impedes the effect of attitude on purchase intention. The r^2 value represents that the relationship between attitude and purchase intention is highly significant and the attitude is capable of explaining the 60 percent change in purchase intention, hence the model fit is high. However, the beta value of economic status is -0.026 and its p-value is 0.864 which is higher than 0.05. So, the effect of the interaction variable on purchase intention is insignificant. In conclusion, it is the attitude that strongly determines the purchase intention of the consumers than their economic status, when energy-efficient appliances are concerned.

Slope Analysis

The three approximately parallel lines suggest that the moderator economic status (ECO) has a relatively consistent effect on the relationship between attitude (ATT) and purchase intention (PI). The lack of significant interaction implies that the effect of ATT on PI does not vary substantially across different levels of the moderator. All lines show a positive slope, indicating that attitude (ATT) increases, and

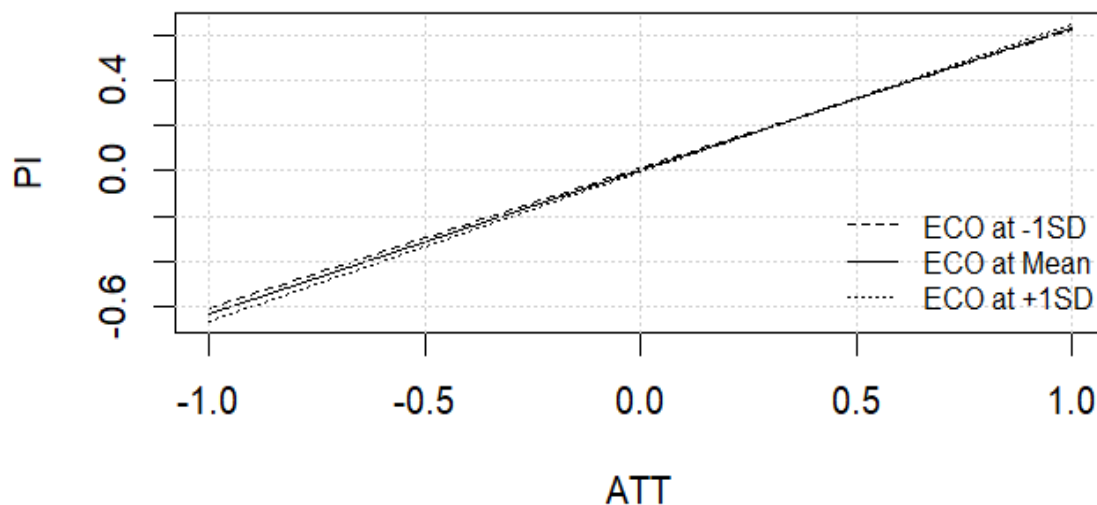


Figure 3 Slope Analysis of the Bootstrapped Model

purchase intention (PI) also increases, regardless of the level of the moderator, economic status (ECO). The steepness of the slope seems similar across the three lines, supporting the idea that the moderating effect is minimal or not strong enough to manifest differences in the slopes. The plot suggests that the independent variable attitude (ATT) positively influences the dependent variable purchase intention (PI). Abidingly across all levels of the moderator economic status (ECO). The moderation effect of economic status (ECO) is insignificant.

Practical Implications

India is one of the fastest-growing economies in the world and with increasing GDP and output, the energy demand is also increasing very rapidly. India needs to find ways in which the increasing energy demand could be fulfilled, the population is becoming aware of the benefits of buying energy-efficient appliances, and they are aware of the fact that long-term savings on electricity bills will help them reduce their electricity expenditure. The relationship shared by the exogenous variables states that it is the environmental knowledge and environmental concern that shape the Attitude of the customers and ultimately determine their purchase intentions, in other words, people who are motivated to participate in environmental protection will push their limits to purchase energy-efficient/ eco-friendly products (Zhang

et al., 2022). The beta coefficient value of 0.694 represents that Attitude explains around 70 percent change in Purchase intention. The Subjective Norms and Eco-label knowledge have no significant relationship with Attitude. So, it is the environmental knowledge and environmental concern that determines Purchase Intention in the present case.

H1 is supported, as the path coefficient of Attitude is 0.694 and is also significant with a t-value of 6.221, and its null hypothesis can be rejected with a P value of 0.00. The path coefficient value of environmental knowledge and environmental concern shows a significant relationship with Attitude and hence H3 and H4 are supported. On the contrary, the relationship of subjective norms and eco-label knowledge with attitude is insignificant, as a result, H2 and H5 are not supported. The subjective norms are the opinions made based on the surroundings and as a result, they impact the attitude, however in this case the relationship is insignificant, which is in sync with the literature (Taufique et al., 2018). Similarly, the results suggest that eco-label knowledge has less role in shaping the attitude of the consumers (insignificant), which represents some prevalence of green skepticism among the sample population, surprisingly the results are in contrast to the literature (Hossain et al., 2022). Although the values are insignificant, it cannot be straight away concluded that it is greenwashing or green skepticism (Gigol and Gigol, 2022).

Environment knowledge and environmental concerns shape the attitude of the consumers' which has a stronger effect on purchase intention than the economic status of the consumers, so the marketing agencies can further use this relationship to motivate the customers in a much more effective manner. Intrinsically motivated consumers tend to purchase green products/energy-efficient appliances, as they consider it a moral obligation to be sensitive towards the environment. The R^2 value for attitude as 0.597, represents a good model fit.

Furthermore, the study captures the influence of the economic status of the consumers on their decision-making for energy-efficient products. It is apparent that economic status has a deterring impact on purchase intention, but its impact is not significant. The beta coefficient value of the interaction value of economic status (ES) x attitude (ATT) $\rightarrow$ purchase intention (PI) is -0.026 with a p-value of 0.864. The study also claims that environmental concern and environmental knowledge are the primary factors that shape the attitude of consumers toward energy-efficient appliances.

Summary of the Findings

The present work is a contribution to the existing literature available on green consumer behavior. The study focuses on the cognitive aspect of attitude, attitude is composed of cognitive, effective, and behavioral aspects of a human's psychology (Blum and Naylor, 1968). The theoretical model suggests that subjective norms, environmental knowledge, environmental concern, and eco-label knowledge shape the attitude of the consumers and further determine the consumer's purchase intention toward energy-efficient appliances. The model attempts to capture the impact of interaction variables (moderator) on the purchase intention, and the results indicate that the relationship between environmental knowledge, and environmental concern with attitude is significant and it is evident that both environmental knowledge and environment concern shape the attitude of the consumers. On the contrary, the subjective norms and eco-label knowledge represent an insignificant relationship with attitude. Furthermore, the influence of economic status (moderator) of the consumers is insignificant, in other words, the individual who is intrinsically motivated to purchase eco-friendly/energy-efficient appliances may push their economic barriers to ensure no or less damage to the environment (Taufique, 2018).

The r^2 , HTMT, VIF, AVE, Cronbach's alpha, composite reliability (CR), t-value, and corresponding p-value indicate that Attitude explains around 60 percent change in purchase intention and can be considered the most important factor in determining the purchase intention of the consumer, The HTMT values are less than 0.85 indicating the high discriminant validity, The values of VIF are between greater than 1 and less than 5 which indicates moderate multicollinearity. Similarly, the AVE values are above 0.5 indicating high reliability, and the Cronbach's alpha value is also above 0.7 indicating high internal consistency. The composite reliability value is also above 0.7, which is well above the threshold value. In a nutshell, it is apparent that environmental knowledge and environmental concern shape the consumers' attitude, and attitude determines the purchase intention towards energy-efficient appliances.

Limitations and Future Research

The present work is an addition to the existing literature, however, there are some limitations of the study as well. The author used the economic status of the respondents based on the asset score index (ASI) values by dividing the data into two segments where 0 is assigned to the households with less than average number of consumer durables from the asset score index, and 1 was assigned to the households with equal or greater than average assets scores. Furthermore, authors may use gender as a moderator and can evaluate the gender differences in purchase intention toward energy-efficient appliances. Another limitation that the present study has is that it uses primary data collected at a point in time, and to get more reliable results, the authors might consider using the panel data for future research work. It was also observed that the asset score index values have failed to capture the actual impact of the income component on the consumers' buying behaviour and for future research, the author may use per capita consumption expenditure as an indicator for the Economic Status component. Last but not least, the author selected an employee working at a higher education level such as a college/university in India as the respondent. However, that is a purposively selected group of respondents, but the authors' in future attempts can use a more representative sample of the society i.e. more general population.

Conclusion

Consumers who are well aware of the importance of the environment are buying energy-efficient appliances believing it contributes to a sustainable future. The overall analysis indicates that those who are more concerned about the environment and have environmental knowledge have shown pro-environmental behaviour while making a consumption decision. Surprisingly, for the consumers who are highly self-motivated to buy energy-efficient appliances, in their case the impact of economic status was found insignificant, which implies that self-motivated people firmly believe that they are making the right decision by purchasing the energy-efficient appliances, and their decision is independent of their economic status. The graphical representation of the interaction variable suggests the same, that the people within low and high-income status are showing not much deviation in their preference towards energy-efficient appliances. The subjective norms and eco-label knowledge have an insignificant influence on the consumer's decision-making, as far as energy-efficient appliances are concerned.

Policy Suggestions and Scope for Future Research

The present work emphasizes the factors that govern the purchase intention of consumers towards energy-efficient appliances. The author found that it is the cognitive aspect of attitude that determines the purchase intention. The income component was tested for its moderation effect on purchase intention and it was found that the economic status of the consumers does not play a detrimental role in measuring the purchase intention. The analysis suggests that consumers who have completed higher education and are working at the University/College are well aware of the benefits of energy-efficient appliances. However, the price of the energy-efficient appliance is the major obstacle in this regard. To resolve this issue; green marketing, subsidies, Tax reduction, and easy finance can prove helpful. These facilities will further motivate consumers to purchase energy-efficient appliances and in turn, will reduce the carbon footprint. Understanding green behaviour and the factors that govern the decision-making of the consumer is a very broad field, as numerous factors contribute to shaping the consumer's behaviour. The present analysis is a partial analysis of some selected factors that affect the consumer's decision, for further advancement, future research can incorporate other factors of equal importance and can conduct a general analysis of the consumer's behaviour towards energy-efficient appliances.

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Transforming Public Service Performance through Training and Development: A Study of Nigerian Government Agencies

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Keywords

Training and development, public service performance, Nigerian government agencies, inefficiencies, effective governance

Abstract

This study investigated the impacts of training and development on public service performance within Nigerian government agencies. Persistent inefficiencies in training within these agencies present significant challenges to effective governance and the delivery of public services. Although there are various training and development (T&D) programs designed to enhance performance, a considerable number of these agencies continue to underperform. This research is contextualized within Human Capital Theory. The study is a descriptive cross-sectional survey. By analyzing a sample of 1,216 public servants, the researchers identified critical demographic variables, including gender, marital status, age, and years of service, and educational qualifications that influence perceptions of training effectiveness. The results indicate that over 90% of respondents agree that adequate training and development opportunities enhance their performance, reflecting a strong commitment to continuous learning. Moreover, findings underscored the importance of aligning training initiatives with career advancement opportunities; 90.7% of participants acknowledge awareness of promotion criteria and career development prospects. The study also explored the effectiveness of employee reward systems; 92.7% of respondents perceive rewards as motivating and equitable, thereby fostering a conducive work culture. Additionally, 87% of respondents view performance appraisal processes as transparent and fair, which is essential to the overall framework for performance improvement. The insights highlight the necessity for strategic investments in training and transparent reward mechanisms, which serve as key drivers of public sector effectiveness. This research advocates for an enhanced focus on human capital development within Nigerian government agencies, positing that targeted investments in training, effective reward systems and clear performance appraisals can substantially transform public service delivery. Enhancing transparency and meritocracy in the reward system can strengthen motivation, while the establishment of clear performance appraisal frameworks, incorporating regular feedback and aligning with defined career advancement criteria, will empower employees.

Introduction

The effectiveness of public service in Nigeria remains a significant subject of examination among scholars and policymakers, particularly regarding its implications for national development and governance. The public sector plays an essential role in the formulation and execution of policies and programs designed to enhance the quality of life for Nigerian citizens. However, systemic challenges-including corruption, inefficiency, and a lack of accountability-have severely impeded the optimal performance of these government agencies (Adebayo, 2020). Given these pressing concerns, it is imperative to investigate mechanisms that can enhance public service effectiveness, particularly through the training and development (T&D) of public servants. T&D within the public sector is crucial for fostering a skilled workforce that is adequately equipped to address the demands of contemporary governance. Research indicates that well-structured T&D programs lead to improved service delivery, higher employee motivation, and greater organizational commitment (Musa & Mohammed, 2023).

In the Nigerian context, the government has historically acknowledged the importance of T&D through initiatives such as the Public Service Reform Program and the establishment of various training institutions. These initiatives reflect an understanding that equipping public servants with necessary skills and knowledge is vital for enhancing the operational efficiency of government agencies. Nonetheless, despite

these efforts, the effectiveness and tangible impacts of T&D programs on performance outcomes have not been thoroughly explored (Ezeani & Chinyere, 2021). The relationship between training and public service performance has attracted considerable attention in academic literature. For instance, a study conducted by Adetayo et al. (2022) emphasizes the direct correlation between comprehensive training initiatives and improvements in service delivery metrics within Nigerian government agencies. These findings suggest that targeted training programs not only provide employees with essential skills but also promote a culture of accountability and service excellence. Conversely, a lack of emphasis on continuous professional development often results in stagnation and inefficiency within public institutions (Ibrahim, 2023). Therefore, a thorough understanding of how T&D influences performance is crucial for advancing the effectiveness of public service.

The emergence of modern technologies and evolving public expectations necessitates a reassessment of traditional training methodologies. The integration of innovative training methods, such as e-learning and on-the-job training, has demonstrated enhanced learning outcomes and adaptability among public servants (Olaoye et al., 2023). As Nigeria continues to confront multifaceted challenges, including economic instability and increasing public scrutiny, the imperative for a dynamic and responsive public service becomes increasingly pronounced. Incorporating contemporary T&D approaches may constitute a transformative strategy for navigating these complexities, thereby fostering a more efficient and accountable government. The ongoing challenges faced by Nigeria's public service sector underscore the urgent requirement for effective T&D strategies aimed at strengthening public servant competencies and improving overall agency performance.

While historical initiatives reflect an acknowledgment of this necessity, there remains a considerable gap in empirical evidence that assesses the impact of these training programs on performance metrics. Consequently, this study aims to explore the transformative potential of T&D in enhancing public service performance within Nigerian government agencies, thereby providing insights that could inform future policies and initiatives aimed at fostering a more effective and accountable public service. In Nigeria, the persistent inefficiencies that are evident within government agencies present significant challenges to effective governance and public service delivery. Despite the existence of various T&D programs intended to enhance public service performance, a substantial proportion of these agencies continue to operate below their potential. This paradox raises critical questions regarding the effectiveness of current T&D practices and their alignment with the needs of public servants as well as the overarching objectives of governmental institutions.

One of the principal issues identified is the absence of comprehensive needs assessments prior to the implementation of training programs. In the absence of an accurate understanding of the specific skills and competencies required by public servants, training initiatives frequently fail to achieve their intended objectives, resulting in a disconnect between training content and the actual performance expectations of employees (Ibrahim & Tukur, 2023). Additionally, many programs are designed without adequate consideration for the unique contexts and challenges encountered by different government agencies, leading to generic training solutions that do not effectively address the nuanced needs of the workforce (Adeyemo, 2022). There is a significant lack of alignment between the training objectives and the strategic goals of the respective agencies. The disconnect between the content delivered during training and the skills required in the workplace creates a scenario in which employees return to their positions without the relevant capabilities necessary to enhance their performance effectively. This misalignment can be attributed to insufficient collaboration between training providers and agency leadership, as well as limited involvement of employees in the planning phases of training programs (Okoro & Okwu, 2023).

Another crucial factor undermining the effectiveness of training and development initiatives is the inadequacy of follow-up mechanisms to evaluate the application of acquired skills. Many training programs conclude without a structured plan for monitoring and assessing the impact of training on job performance (Jibril & Agbaji, 2024). This lack of follow-up not only restricts the potential for skill transfer but also diminishes accountability among participants and trainers alike. Consequently, public servants often return to environments that do not facilitate the application of newly acquired skills, thereby undermining the value of the training received. The cumulative effects of these challenges result in a workforce that is insufficiently equipped to address the complexities of public service, perpetuating a cycle of suboptimal performance and citizen dissatisfaction. This situation is exacerbated by broader systemic issues, such as

bureaucratic inertia, limited resources, and a prevailing culture that frequently undermines the importance of continuous professional development (Ibrahim & Tukur, 2023).

In contrast, the adaptation of employees to technological challenges should be supported through human capital development, including on-the-job training programs designed to provide the workforce with essential skills. Such initiatives have the potential to significantly enhance employees' confidence, competence, and overall job satisfaction (Adeniyi, 2024). Furthermore, management within organizations should ensure that adequate human capital development opportunities are in place to facilitate employees' adjustment to emerging technological trends and to optimize the utilization of newly adopted equipment (Adeniyi & Omolawal, 2024). In light of the prevalent challenges, it is imperative to examine the design and implementation of targeted training and development initiatives aimed at enhancing public service performance within Nigerian government agencies. This study seeks to conduct a thorough analysis of current practices to identify effective strategies for aligning training programs with organizational objectives. Furthermore, it will focus on enhancing the relevance of training content through tailored needs assessments and establishing robust follow-up mechanisms to ensure the practical application of acquired skills in the workplace.

The outcomes of this research will contribute to the broader discourse surrounding public administration and provide actionable insights for policymakers and public sector leaders dedicated to improving service delivery through effective human resource development. Recent studies have underscored the crucial role of training and development in bolstering public service performance, particularly within Nigerian government agencies, where systemic challenges frequently obstruct efficacy (Adebayo & Odukoya, 2022; Eze et al., 2023). Researchers such as Ogundipe et al. (2021) have investigated the correlation between employee training programs and job satisfaction, while other scholars have focused on the influence of leadership styles on performance outcomes (Ibrahim & Tukur, 2022). Nevertheless, existing literature often lacks a comprehensive examination of how customized training and development interventions specifically address the distinct challenges encountered by various Nigerian government agencies, as well as their long-term impact on public service performance metrics. This study endeavors to fill this significant gap by analyzing the efficacy of tailored training programs and their role in transforming public service outcomes within the Nigerian context, thereby providing a nuanced understanding that has largely been overlooked in prior research.

Literature Review

The performance of public services is crucial for the effective functioning of government agencies, especially in developing countries like Nigeria. Recent literature has placed considerable emphasis on enhancing public service performance through targeted training and development initiatives. This review examines existing studies on training and development within Nigerian government agencies and explores their impact on performance outcomes.

Current State of Public Service in Nigeria

The performance of Nigerian government agencies has historically been hindered by systemic issues such as corruption, inadequate resources, and poor management practices (Akinyemi & Olowookere, 2021). Recent studies emphasize the urgent need for reform, focusing on enhancing the skills and competencies of public servants (Ibrahim & Kola, 2023). A significant barrier to improving performance metrics is the lack of structured training programs (Ojo & Owolaye, 2022).

The Role of Training and Development

Training is a vital component of public service reform, designed to equip employees with the necessary skills and knowledge. Evidence suggests that comprehensive training programs can lead to increased efficiency, improved service delivery, and higher employee morale (Nnadi & Otu, 2021). For instance, a study by Yusuf and Osagie (2023) found that structured training initiatives in Nigerian agencies resulted in a 30% improvement in service delivery metrics. Various training modalities, including on-the-job training, workshops, and e-learning, have been explored in the Nigerian context. On-the-job training, in particular, has been noted for its relevance and applicability in public service (Bello & Kola, 2022). E-learning platforms,

accelerated by the COVID-19 pandemic, have also emerged as effective tools for continuous professional development (Ogunyemi & Odugbemi, 2023).

Challenges to Effective Training Implementation

Despite the recognized importance of training, several challenges hinder its effectiveness. Funding constraints are a significant barrier, as many government agencies struggle to allocate sufficient resources for training initiatives (Adeyemi & Afolabi, 2022). Additionally, there is often a disconnect between training content and actual job requirements, leading to suboptimal outcomes (Nwachukwu & Ibe, 2023).

Evaluating Training Impact on Performance

Evaluating training programs is essential to ascertain their impact on public service performance. Recent studies advocate for adopting performance metrics that align with organizational goals (Ezeani & Anyanwu, 2023). For example, pre- and post-training assessments can provide quantitative data on performance improvements, offering insights into the effectiveness of training interventions. Several case studies illustrate the transformative potential of training initiatives. The Lagos State Public Service Training Institute, for example, implemented a comprehensive training program that resulted in significant improvements in public service delivery and citizen satisfaction (Afolabi, 2023). Such success stories underscore the importance of strategic planning and implementation in training efforts. The literature highlights the pivotal role of training and development in transforming public service performance within Nigerian government agencies. While challenges remain, strategic investments in employee training can yield significant improvements in service delivery and efficiency. Future research should focus on developing tailored training programs that closely align with the specific needs of public agencies to ensure sustainable performance enhancements.

Theoretical Framework

This paper is grounded in several prominent theories, notably Human Capital Theory (Becker, 1993), which asserts that investment in employee training significantly enhances skills and productivity. Additionally, the Capability Approach (Sen, 1999) underscores the importance of equipping individuals with the necessary capabilities for effective public service. Collectively, these frameworks emphasize the critical need for a well-trained workforce to achieve optimal outcomes in public service.

Human Capital Theory (HCT)

Human Capital Theory (HCT) posits that investments in education and training substantially increase an individual's productivity and economic output (Becker, 1993). Within the realm of public service, investing in training and development (T&D) is anticipated to lead to improved performance through the enhancement of employee competencies and skills. This theory highlights the importance of considering employees as valuable assets whose development directly contributes to increased agency effectiveness. HCT posits that individuals invest in their education, training, and health to elevate their productivity and earning potential. Just as physical capital, such as machinery, contributes to economic output, human capital—the skills and knowledge possessed by individuals—plays an essential role in economic growth and development. By acquiring education and skills, individuals enhance their capabilities, benefiting themselves through higher wages and enhanced job opportunities, while simultaneously contributing to overall economic performance.

HCT emphasizes the significance of investments in human capital at both individual and societal levels. It is imperative for governments and organizations to allocate resources towards education and workforce development, viewing these expenditures as integral to long-term economic health. The theory contends that nations with higher levels of human capital are likely to experience greater economic growth, innovation, and competitiveness in the global market. However, critics argue that HCT may oversimplify the complexities of labor markets and social inequalities, frequently overlooking systemic barriers and disparities in access to education. In the context of Nigeria, the study entitled "Transforming Public Service Performance through Training and Development" elucidates the pivotal role of human capital in enhancing public service delivery. By focusing on the ongoing professional development of public servants, the research asserts that well-trained employees are better prepared to meet the demands of their roles,

ultimately resulting in enhanced organizational performance. This perspective aligns with HCT's assertion that human capabilities are vital assets driving institutional success.

The study indicates that numerous Nigerian government agencies experience performance inefficiencies primarily due to inadequate training and development programs. HCT suggests that insufficient investment in human capital can lead to skill gaps, diminished motivation, and decreased productivity among employees. By identifying these deficiencies, the research underscores the necessity of tailored training initiatives that not only develop specific competencies but also foster a culture of lifelong learning. This approach is consistent with HCT's premise that enhancing the skills and knowledge of employees can yield improved service delivery and heightened public trust in governmental institutions. Moreover, the findings of this study indicate that effective training and development can serve as a strategic tool for government agencies to adapt to the changing demands of public service.

In this respect, within the context of Human Capital Theory (HCT), investment in human capital is critical for fostering innovation and resilience in the public sector. By prioritizing training initiatives, Nigerian government agencies can cultivate a skilled workforce capable of addressing contemporary challenges. This commitment to human capital development not only enhances the performance of individual agencies but also contributes to broader national objectives, including improved governance and socio-economic development.

Methodology

This chapter delineates the methodologies employed to investigate how training and development can enhance public service performance within Nigerian government agencies. A cross-sectional survey research design was selected to facilitate the collection of primary data from a diverse participant base, thereby providing a comprehensive understanding of the prevailing phenomena. Survey research proves particularly advantageous for addressing specific research questions, evaluating needs, and establishing performance baselines for future comparisons (Creswell, 2022). The target population consists of employees from selected government agencies in Nigeria: the National Insurance Commission (NAICOM), the National Pension Commission (PENCOM), the Nigeria Deposit Insurance Corporation (NDIC), the Nigerian Maritime Administration and Safety Agency (NIMASA), the Nigerian Shippers' Council (NSC), and the National Economic Empowerment & Development Strategy (NEEDS), encompassing a total of 5,068 public servants.

It should be known that a simple random sampling technique was employed to ensure representativeness and to minimize classification errors. This methodology resulted in a determined sample size of 1,485, calculated using a confidence level of 95% and a margin of error set at 5%, with an additional 30% increase to account for potential non-responses (Fowler, 2021). Data collection was conducted utilizing a structured questionnaire divided into three sections: demographic information, talent management variables, and performance indicators. The questionnaire was adapted from validated instruments in human capital management and public service performance literature, ensuring both relevance and clarity (Abazeed, 2018; Mabaso & Moloi, 2016). A pilot study involving 149 respondents was conducted, which led to refinements in the instrument, thereby enhancing its reliability and relevance.

In order to ensure the validity of the research instrument, expert reviews were conducted with highly regarded senior lecturers, and construct validity was confirmed through factor analysis. This analysis produced a Kaiser-Meyer-Olkin (KMO) measure, indicating adequate sampling adequacy (Kaiser, 1974). Additionally, the reliability of the questionnaire was assessed using Cronbach's alpha, resulting in an overall reliability index of 0.8246, which is considered acceptable for social science research (Tavakol & Dennick, 2011). Data collection was carried out through Likert-type scale questionnaires administered by trained research assistants at the headquarters and branches of the relevant agencies. This primary data collection method was crucial for obtaining reliable, firsthand information (Babbie, 2021).

For data analysis, the Statistical Package for the Social Sciences (SPSS) was employed to conduct both descriptive and inferential statistics. Descriptive statistics provided a summary of data characteristics, while regression analysis was used to explore causal relationships between training and development variables and public service performance. This approach enables predictive modeling based on observable metrics, in alignment with established best practices in market research (Field, 2018). This methodology combines rigorous sampling techniques, validated instruments, and comprehensive data analysis to examine the significant relationship between training and development initiatives and the performance of public servants.

in Nigeria. The study sought to deliver a detailed analysis of how training and development can enhance public service performance in Nigeria. By incorporating theoretical frameworks and employing a robust research methodology, this study sought to provide valuable insights to the fields of public administration and human resource development. The findings will not only advance academic knowledge but also offer practical recommendations to improve the effectiveness of government agencies in Nigeria.

Presentation of Data and Discussion of Findings

Demographic Profiles of Respondents

Table 1.1: Demographic Profiles of Respondents

	Frequency	Percentage
Gender		
Male	662	54.4
Female	554	45.6
Total	1216	100%
Marital Status		
Single	395	32.5
Married	745	61.3
Others	76	6.3
Total	1216	100%
Age		
25-30	105	8.6
31-35	271	22.3
36-40	224	18.4
41-45	331	27.2
46-50	183	15.0
51 & above	102	8.4
Total	1216	100%
Year in Service		
0 – 10	380	31.3
11 – 20	638	52.5
21 years and above	198	16.3
Total	1216	100%
Educational Qualification		
NCE/OND	184	15.1
Bachelor's Degree	833	68.5
Master's Degree	195	16.1
Doctorate	4	0.3
Total	1216	100%

In table 1.1, the demographic profile of the respondents is presented, encompassing essential factors such as gender, marital status, age brackets, years of service, and educational qualifications of individuals recruited from governmental agencies and parastatals. Understanding the demographic composition detailed in this study on the performance of Nigerian government agencies through training and development is critical for contextualizing the findings. This section outlines significant demographic variables, including gender, marital status, age, years of service, and educational qualifications. Among the 1,216 respondents, there is a slight male predominance, with 54.4% (n = 662) identifying as male and 45.6% (n = 554) identifying as female. This gender distribution indicates a relatively balanced representation, albeit with a modest inclination towards male employees in Nigerian governmental agencies. The representation of gender holds significance in public service contexts, influencing organizational dynamics and potentially affecting the effectiveness of training and development programs (Adeleke et al., 2022).

With regard to marital status, a majority of respondents are married, comprising 61.3% (n = 745), while 32.5% (n = 395) are single. A smaller segment, 6.3% (n = 76), falls into other marital categories. This distribution suggests that married individuals predominantly occupy the workforce in these agencies, which may influence their commitment to training and professional development initiatives. Research indicates

that marital status can affect job satisfaction and performance within the public sector (Ogunleye & Adebayo, 2023). The age distribution of respondents reveals a diverse range of experience levels. The largest age group comprises individuals aged 41-45 years, representing 27.2% (n = 331) of the respondents, followed by those aged 31-35 years at 22.3% (n = 271) and 36-40 years at 18.4% (n = 224). Notably, younger age groups (25-30 years) and older individuals (51 years and above) comprise 8.6% (n = 105) and 8.4% (n = 102), respectively. This diversity of age may influence training needs and preferences within the agencies, as various age groups tend to exhibit differing attitudes toward learning and development (Eze et al., 2024).

In terms of years of service, the majority of respondents (52.5%, n = 638) have served between 11 and 20 years, while 31.3% (n = 380) have been in service for 0 to 10 years. A smaller segment, comprising 16.3% (n = 198), has over 21 years of service. This distribution indicates a workforce with significant experience, particularly within the mid-range years of service, which may correlate with established organizational knowledge and effectiveness in the implementation of training programs (Abubakar & Mustapha, 2023). The educational qualifications of the respondents reflect a predominantly well-educated workforce, with 68.5% (n = 833) holding a Bachelor's Degree. A smaller percentage possesses a Master's Degree (16.1%, n = 195), while individuals with National Certificate in Education or Ordinary National Diploma (NCE/OND) comprise 15.1% (n = 184). Only 0.3% (n = 4) hold Doctorates.

The high level of education within the workforce suggests that training and development initiatives should be strategically tailored to effectively utilize this educational background. Higher educational attainment is often linked to improved job performance and a greater ability to engage with complex training materials (Adeniran & Olawumi, 2023). This demographic analysis provides valuable insights into the characteristics of respondents involved in the study on training and development within Nigerian government agencies. Understanding these demographic factors is crucial, as they inform how training programs can be designed and implemented to enhance public service performance. The predominance of married, mid-career, and well-educated individuals indicates the necessity for targeted training strategies that address both the professional and personal development needs of these employees. Moving forward, training initiatives should be mindful of these demographics to maximize engagement and effectiveness.

Table 1.2: Training and Development

S/ N	Training and Development	Strongly Agree	Agree	(Neutral	Disagree	Strongly Disagree
1	I have received adequate training support to perform my duties effectively.	478 (39.3)	628 (51.6)	88 (7.2)	13 (1.1)	9 (0.7)
2	I have access to various training opportunities to enhance my public servant skills.	521 (42.8)	512 (42.1)	113 (9.3)	52 (4.3)	18 (1.5)
3	I receive adequate support and resources to apply what I have learned from training sessions to my work.	483 (39.7)	585 (48.1)	80 (6.6)	68 (5.6)	0 (0.0)
4	I have learning goals designed to enhance my current work assignment and to prepare me for future positions.	394 (32.4)	654 (53.8)	140 (11.5)	28 (2.3)	0 (0.0)
5	The public service encourages continuous learning and professional development.	458 (37.7)	547 (45.0)	167 (13.7)	30 (2.5)	14 (1.2)

The efficacy of public service agencies is paramount for national development, particularly within the intricate and diverse context of Nigeria. A fundamental aspect of enhancing the performance of public servants is the establishment of comprehensive training and development programs. This paper elucidates findings related to training and development initiatives within Nigerian government agencies, examining their influence on employee performance and overall service delivery.

Table 1.2 encapsulates the responses from public servants concerning their experiences with training support, opportunities for skill enhancement, application of acquired skills, goal-setting, and the promotion of continuous learning. The responses are categorized into five levels of agreement: Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree. The gathered data illustrates a range of satisfaction levels among

employees regarding the support and opportunities afforded to them. The initial statement regarding adequate training support garnered a favorable response, with 39.3% of respondents strongly agreeing and 51.6% agreeing. This indicates that a considerable majority (90.9%) perceive that their training needs are being effectively addressed, a vital component for achieving optimal job performance (Osman, 2022).

The subsequent statement highlights access to various training opportunities, demonstrating that 42.8% strongly agree and 42.1% agree. This reflects a robust acknowledgment of the available resources designed to facilitate skill enhancement among public servants. Sustained access to training is essential for fostering employee growth and adaptability in a rapidly evolving work environment (Akanbi & Olaniyan, 2023). Responses to the third statement suggest that 39.7% strongly agree and 48.1% agree that they receive adequate support in applying their learned skills. This finding indicates that, while a majority feel supported in translating training into practical application, there remains significant room for improvement regarding the consistent availability of necessary resources (Obinna et al., 2023).

With respect to goal-setting, 32.4% of respondents strongly agree, and 53.8% agree that they possess clear objectives aimed at enhancing their current roles and preparing for future positions. Nonetheless, a notable percentage (11.5%) remains neutral, possibly signifying a lack of clarity in the goal-setting process (Ibrahim & Mankodi, 2023). The concluding statement addressing continuous learning reveals that 37.7% strongly agree and 45.0% agree that the public service promotes ongoing professional development. This positive feedback underscores an organizational culture that values continuous improvement; however, with 13.7% remaining neutral, inconsistencies in the application of these values across various agencies may exist (Owojori, 2022).

Invariably, the data presents a generally favorable perception of training and development among public servants in Nigerian government agencies. It also highlights areas requiring further enhancement, especially concerning the practical application of training and the clarity of goal-setting. As Nigeria continues to address complex governance challenges, investment in training and development will be critical for nurturing a competent and adaptive public service workforce. Continuous research and evaluation of training programs will ensure alignment with the evolving needs of public servants and ultimately contribute to improved public service performance.

Table 1.3: Employees Reward System

S/ N	Employees Reward System	Strongly Agree	Agree	(Neutral	Disagree	Strongly Disagree
1	The rewards offered by our organisation are fair and equitable.	635 (52.2)	493 (40.5)	64 (5.3)	19 (1.6)	5 (0.4)
2	The rewards provided by our organisation motivate me to perform.	534 (43.8)	614 (50.5)	54 (4.4)	9 (0.7)	5 (0.4)
3	The rewards the public service offers align with my values and motivations.	540 (44.4)	592 (48.7)	84 (6.9)	0 (0.0)	0 (0.0)
4	Public service rewards contribute to my positive work culture.	601 (49.4)	488 (40.1)	90 (7.4)	32 (2.6)	5 (0.4)
5	The process for determining and distributing rewards is transparent and merit-based.	407 (33.5)	508 (41.8)	292 (24.0)	9 (0.7)	0 (0.0)

Effective public service performance is essential for ensuring governance and administrative efficiency in any nation. In Nigeria, as in several other countries, employee motivation, facilitated by reward systems, is integral to enhancing performance within government agencies. This paper examines employees' perceptions of the reward systems in the Nigerian public sector and the extent to which these perceptions influence their motivation and overall performance. The study draws upon recent data collected from employees to evaluate the effectiveness of these reward systems and their implications for training and development. The reward system represents a critical element that affects employee motivation and satisfaction within public service institutions.

Table 1.3 presents a comprehensive overview of employee perceptions concerning the fairness, motivational impact, alignment with personal values, contribution to workplace culture, and transparency of

the reward systems within their organizations. In Table 1.3, a substantial majority of respondents-52.2% strongly agree and 40.5% agree-believe that the rewards provided by their organization are fair and equitable. This perception is vital, as it cultivates trust and loyalty among employees, which can enhance their performance (Oke, 2023). The survey results indicate that 43.8% of employees strongly agree that the rewards effectively motivate them, while 50.5% express agreement. This suggests a significant correlation between reward systems and employee motivation, reinforcing the necessity for government agencies to prioritize effective reward mechanisms (Adetunji & Ojo, 2023).

The data further reveals that 44.4% of respondents strongly agree that the rewards align with their personal values and motivations. Such alignment is essential for fostering a motivated workforce, as it connects employees' intrinsic values with external rewards (Nwachukwu, 2023). Moreover, 49.4% of employees strongly agree that public service rewards contribute to a positive organizational culture, indicating that a well-structured reward system can significantly enhance workplace satisfaction and collaboration (Obasi, 2023). Nevertheless, despite the positive perceptions expressed in other areas, only 33.5% strongly agree that the reward distribution process is transparent and merit-based, with 24% remaining neutral. This highlights certain areas that require improvement.

Transparency in the reward distribution process is crucial for fostering trust and perceived fairness among employees (Babatunde & Olaniyan, 2023). The findings of this study illustrate that reward systems within Nigerian public service agencies substantially influence employee motivation and overall performance. While a majority of employees regard the rewards as fair, motivating, and aligned with their values, the perceived lack of transparency in the reward distribution process presents challenges that must be addressed. The implementation of effective training and development programs, which incorporate feedback on reward systems, could enhance public service performance and employee satisfaction significantly.

Table 1.4: Performance Appraisal

S/ N	Performance Appraisal	Strongly Agree	Agree	(Neutral	Disagree	Strongly Disagree
1	I receive regular feedback on my performance throughout the performance appraisal period.	442 (36.3)	595 (48.9)	133 (10.9)	28 (2.3)	18 (1.5)
2	Performance criteria and expectations are communicated.	405 (33.3)	606 (49.8)	163 (13.4)	37 (3.0)	5 (0.4)
3	The performance appraisal process helps me to identify areas for my performance improvement.	376 (30.9)	583 (47.9)	197 (16.2)	41 (3.4)	19 (1.6)
4	The performance appraisal is conducted fairly and objectively, without bias or favouritism.	425 (35.0)	629 (51.7)	139 (11.4)	23 (1.9)	0 (0.0)
5	Based on my experience with performance appraisal contributes to improving my service delivery.	336 (27.6)	704 (57.9)	124 (10.2)	38 (3.1)	14 (1.2)

In examining the effectiveness of performance appraisals within Nigerian government agencies, it is essential to understand employees' perceptions of the appraisal process. The following table summarizes employee responses regarding various aspects of performance appraisal, including the frequency of feedback, communication of performance criteria, and the perceived fairness of the appraisal process. The effectiveness of performance appraisals is vital for enhancing public service performance, especially within the context of Nigerian government agencies. The survey results presented reflect employee perceptions of different aspects of the performance appraisal process, highlighting potential areas for improvement in training and development initiatives.

The survey data in Table 1.4 indicates a strong consensus among respondents regarding the receipt of regular feedback, with 85.2% either strongly agreeing or agreeing that they receive constructive performance evaluations. This high level of positive feedback suggests that government agencies are effectively

facilitating communication, which is essential for fostering an environment of continuous improvement (Olaoye et al., 2022). Furthermore, a notable 83.1% of respondents affirm that performance criteria and expectations are adequately communicated, underscoring the importance of clarity in performance standards. This transparency is critical for aligning employee objectives with organizational goals (Ajayi & Owuoye, 2023). Additionally, 78.8% of respondents believe that the appraisal process helps identify areas for improvement, highlighting the potential of performance appraisals as tools for professional development (Idris & Saad, 2023).

A crucial aspect of performance appraisal is its fairness. The data reveals that 86.7% of respondents feel that appraisals are conducted fairly and objectively. This perception is vital for maintaining trust in the appraisal process and ensuring that employees feel valued (Udom et al., 2023). The absence of reported bias or favoritism can further encourage a culture of accountability and transparency within government agencies. Moreover, the finding that 85.5% of employees believe performance appraisals contribute to improved service delivery suggests that effective appraisal systems can have a direct positive impact on public service outcomes (Nwafor et al., 2023). This insight emphasizes the need for ongoing training and development programs that not only enhance employees' skills but also empower them through constructive feedback mechanisms.

The findings of this survey underscore the vital role that performance appraisals play in enhancing public service delivery in Nigerian government agencies. To further improve these processes, it is advisable for agencies to implement regular training for evaluators, ensuring consistent feedback and equitable assessments. Moreover, fostering an atmosphere of open communication and encouraging continuous professional development can significantly boost employee engagement and enhance overall service delivery (Suleiman et al., 2023).

Table 1.5: Career Advancement

S/ N	Career Advancement	Strongly Agree	Agree	(Neutral	Disagree	Strongly Disagree
1	There are opportunities for career development and advancement in the public service.	516 (42.4)	587 (48.3)	85 (7.0)	23 (1.9)	5 (0.4)
2	I know of career advancement opportunities in public service.	612 (50.3)	518 (42.6)	81 (6.7)	5 (0.4)	0 (0.0)
3	The civil service provides clear criteria for promotion.	586 (48.2)	522 (42.9)	93 (7.6)	15 (1.2)	0 (0.0)
4	Promotion decisions are made based on merit and performance.	585 (48.1)	517 (42.5)	105 (8.6)	4 (0.3)	5 (0.4)
5	I am optimistic about my future growth and progression within the public service.	549 (45.1)	464 (38.2)	170 (14.0)	19 (1.6)	14 (1.2)

Public service performance is significantly influenced by the availability of career advancement opportunities within government agencies. Training and development are essential components in enhancing employee satisfaction, retention, and overall performance (Smith, 2022). This paper investigates the perceptions of employees within Nigerian government agencies regarding career advancement opportunities and the implications for their professional development. Data presented in Table 1.5 illustrates public service employees' perceptions of career advancement within their respective agencies. A substantial majority of respondents demonstrated a positive outlook regarding the availability of career development opportunities, with 42.4% strongly agreeing and 48.3% agreeing that such options exist in the public service. This finding reflects a generally favorable perception among employees concerning their prospects for growth.

When inquired about awareness of career advancement opportunities in the public service, 50.3% of participants strongly agreed, while 42.6% agreed, indicating a relatively high level of awareness among employees. This awareness is critical, as it serves to motivate employees to pursue their professional development and engage in relevant training programs. Moreover, with respect to the clarity of promotion criteria, 48.2% strongly agreed and 42.9% agreed that the civil service provides transparent criteria for promotion. Such clarity is likely to enhance job satisfaction and employee morale, as individuals are more

apt to feel secure in their positions when they comprehend the pathways available for advancement (Jones & Taylor, 2023).

In a similar vein, the data reveals that a considerable portion of employees harbors optimism about their future growth within public service, with 45.1% expressing strong agreement with this sentiment. This optimism is vital, as it can lead to heightened motivation and engagement, thereby improving performance outcomes (Adams, 2023). The strong correlation between perceived advancement opportunities and training initiatives suggests that government agencies should allocate resources towards structured training programs designed to equip employees with the skills necessary for career progression.

In light of these findings, it is critical for Nigerian government agencies to adopt comprehensive training and development strategies that not only highlight available career advancement opportunities but also furnish the requisite support and resources for employees to attain their professional objectives. The insights garnered from the analysis of career advancement perceptions among Nigerian government agency employees underscore the significance of fostering an environment conducive to professional growth. By prioritizing training and development, public service agencies can positively influence employee perceptions and performance, resulting in improved service delivery and enhanced public trust. Future research should investigate specific training programs that effectively address the career advancement needs of employees within the public service sector in Nigeria.

Theoretical Discussion of Findings

The study principally operates within the framework of Human Capital Theory (HCT). This theory posits that investments in employee training and development are essential for enhancing productivity and performance within organizations. HCT asserts that human capital is a vital resource that significantly contributes to organizational success, particularly in the public sector, where the quality of service delivery directly influences societal well-being. The theory emphasizes that employees who receive adequate training are more likely to exhibit higher levels of competence, innovation, and commitment, thereby leading to improved organizational performance. In Nigeria, public service performance is often hindered by challenges such as inefficiency and a lack of accountability. This study aims to investigate how training and development initiatives can effectively address these deficiencies.

The demographic analysis presented in Table 1.1 reveals a diverse workforce, with a majority being male (54.4%) and married (61.3%). Notably, a significant proportion of employees (27.2%) falls within the 41-45 age bracket, indicating a relatively mature workforce. Additionally, the majority of employees possess a Bachelor's Degree (68.5%), positioning them to benefit from advanced training opportunities. Understanding this demographic context is critical for designing training programs that adequately meet the specific needs of the workforce. This study leverages insights from HCT to advocate for strategic investments in human capital development, which can lead to enhanced job satisfaction, improved service delivery, and ultimately, a transformation in public service performance.

The findings from Tables 1.2 to 1.5 elucidate key aspects of training and development, reward systems, performance appraisals, and career advancement opportunities within Nigerian government agencies. For example, a significant percentage of respondents (51.6%) indicated that they have received adequate training support, reflecting a favorable perception of the current training initiatives. However, challenges remain, particularly with regard to the practical application of training in the workplace, as evidenced by the varying responses concerning the adequacy of resources and support for applying acquired skills. The reward system, detailed in Table 1.3, is instrumental in motivating public servants, with over 52% of respondents strongly agreeing that the reward structure is fair and equitable. This finding aligns with HCT, which underscores the importance of aligning organizational rewards with employee motivations to enhance performance. Data on performance appraisal processes, as outlined in Table 1.4, indicate a need for transparent and objective evaluations to foster trust and facilitate professional growth.

The insights on career advancement opportunities (Table 1.5) indicate that, although there is optimism about growth within the public service, establishing clear promotion criteria is vital for motivating and retaining employees. By integrating these findings, the study advocates for a comprehensive approach to training and development that not only prioritizes skill acquisition but also cultivates an environment that supports continuous learning and professional growth. In conclusion, this research enhances the discussion on human capital within the public sector, emphasizing that strategic training and development initiatives

can markedly improve public service performance in Nigeria, thereby contributing to a more effective and responsive governance framework.

Conclusion

This study underscores the vital importance of training and development in enhancing public service performance within Nigerian government agencies, as examined through the lens of Human Capital Theory. The findings indicate a strong correlation between adequate training support and employee satisfaction, with over 90% of respondents either agreeing or strongly agreeing that they have received sufficient training to execute their responsibilities effectively. This observation suggests that a well-structured training program is not merely beneficial but essential for fostering a skilled workforce capable of meeting the demands of public service. The results reveal that employees generally perceive a high level of support for their professional development and believe that their organizations promote continuous learning. However, despite the acknowledgment of available training opportunities, a considerable proportion of respondents express neutrality regarding the application of acquired skills in their work. This gap emphasizes the necessity for government agencies to not only offer training but also to establish effective mechanisms for translating training into practical performance improvements.

Aligning training initiatives more closely with the specific needs of the public service can facilitate the development of a more competent and effective workforce. Besides, The assessment of performance appraisal and career advancement identifies critical areas requiring reform. Although a majority of respondents perceive the performance appraisal process as clear and equitable, a significant number remain uncertain about its impact on service delivery. Furthermore, while opportunities for career advancement exist, the perception of promotions based on merit must be strengthened. This observation highlights the necessity for transparent and equitable processes in both appraisal and promotion systems, thereby reinforcing the connection between investments in human capital and enhanced public service outcomes. Addressing these issues will not only improve employee morale but also elevate the overall performance of government agencies in Nigeria, paving the way for transformative changes in public service delivery.

To enhance public service performance in Nigerian government agencies, it is imperative to adopt a multifaceted training and development strategy grounded in Human Capital Theory. First, agencies should prioritize comprehensive training programs tailored to the diverse educational backgrounds and experience levels of employees, ensuring that opportunities for skill enhancement are accessible to all, particularly the 52.5% of employees with over a decade of service. Second, fostering a culture of continuous learning is essential; agencies should implement regular workshops and seminars that address current job requirements while preparing employees for future roles, thereby aligning with the aspirations of the 45.6% female workforce.

Enhancing transparency and meritocracy in the rewards system can significantly strengthen motivation, as indicated by the 52.2% agreement on the fairness of rewards, which should be more closely tied to training outcomes and performance improvements. Finally, developing clear performance appraisal frameworks that incorporate regular feedback and align with defined criteria for career advancement will empower employees, increasing their optimism regarding professional growth and directly contributing to improved service delivery. The implementation of these recommendations has the potential to significantly elevate public service efficiency and employee satisfaction in Nigeria.

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Bridging ESG and DEI for Sustainable Economic Restructuring: Implementation Strategies in the Global IT Industry

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Diversity Equity Inclusion, ESG Reporting, Implementation Strategies, IT Companies, Organizational Governance, Policy-Practice Gap

Abstract

This paper investigates how multinational Information Technology (IT) corporations implement and maintain Diversity, Equity, and Inclusion (DEI) initiatives as part of their Environmental, Social, and Governance (ESG) practices across different regulatory environments and external pressures. Drawing on secondary data from 50 international IT corporations, we employ correlation analysis, multiple regression, and cluster analysis to examine the relationship between ESG practices and DEI outcomes, with particular attention to implementation strategies and contextual factors. Our findings reveal four distinct organizational profiles based on ESG-DEI approaches, ranging from companies demonstrating comprehensive integration to those showing minimal commitment. Companies that maintain DEI initiatives achieve significantly better outcomes across all measured dimensions than those that scale back such efforts. Three key factors emerge as critical for successful DEI implementation: integration with business strategy, development of robust success metrics, and resilience-building initiatives. Implementation strategies strongly mediate the relationship between ESG practices and DEI outcomes, suggesting that effective implementation is crucial for translating ESG commitments into tangible DEI results. Notable regional variations exist, with European companies generally showing the highest ESG and DEI scores, followed by North American and Asia-Pacific companies. External environmental factors significantly influence the ESG-DEI relationship, with regulatory frameworks and stakeholder pressure positively affecting outcomes, while political pressure often has a negative effect. The findings contribute to an integrated theoretical framework combining Stakeholder Theory, Resource-Based View, and Institutional Theory, demonstrating how organizational responses to institutional pressures are shaped by stakeholder expectations and strategic resource considerations. For practitioners, our results highlight the importance of strategic integration, robust measurement systems, and resilience-building capabilities in developing sustainable DEI initiatives that can withstand varying external pressures.

Introduction

Background and Context

Environmental, Social, and Governance (ESG) frameworks have become central to how multinational corporations demonstrate responsible business conduct, with Diversity, Equity, and Inclusion (DEI) increasingly recognized as a critical dimension of organizational performance in the Information Technology (IT) sector. Global stakeholders now expect transparent reporting and measurable progress on DEI as part of broader ESG commitments (Liu, 2022; The Conference Board, 2024).

Research Problem

Despite the proliferation of ESG disclosures and public commitments to DEI, a consistent gap persists between what IT corporations report and what they achieve in practice.

For example, while our research found that over 90% of the sampled IT companies include DEI commitments in their ESG disclosures, only 26% demonstrated strong DEI outcomes across multiple metrics. This aligns with broader industry observations, including recent studies that show substantial disparities

between public commitments and measurable progress in the technology sector (McKinsey & Company, 2024).

Secondary analyses of sustainability reports, third-party ESG databases, and annual disclosures reveal that, while most multinational IT firms articulate ambitious DEI goals, evidence of substantive progress – such as increases in workforce diversity, leadership representation, or pay equity – remains limited and uneven (The Conference Board, 2024). This "policy-practice gap" raises important questions about the effectiveness of current ESG strategies, the influence of external pressures, and the role of organizational characteristics in shaping DEI outcomes.

Research Objectives

This paper aims to address the following objectives through systematic secondary analysis:

1. To identify and classify distinct organizational approaches to DEI implementation within multinational IT corporations' ESG frameworks.
2. To determine which implementation strategies most effectively mediate the translation of ESG commitments into measurable DEI outcomes.
3. To examine how organizational characteristics (e.g., company size, geographic location) and external environmental factors (e.g., regulatory frameworks, political climate, stakeholder pressure) moderate the relationship between ESG practices and DEI performance.
4. To develop evidence-based recommendations for building resilient DEI initiatives that can withstand varying external pressures while delivering sustainable outcomes.

Significance of the Study

This research makes both theoretical and practical contributions. Theoretically, it advances understanding of how external and internal factors interact to shape DEI outcomes in the IT sector, using a robust, comparative approach grounded in secondary data. Practically, the findings provide evidence-based insights for IT leaders, policymakers, and stakeholders seeking to close the gap between ESG commitments and real progress on DEI. By leveraging standardized data across multiple jurisdictions and firm profiles, this study offers a nuanced perspective on the drivers and barriers to effective DEI implementation.



Figure 1: Spectrum of Organizational Responses to DEI Initiatives

External Pressure	Description	Influence on DEI Implementation
Regulatory Mandates	Legal requirements for reporting or quotas	Drives formal adoption of DEI policies and establishes minimum compliance standards
Political Climate	Societal and governmental attitudes toward diversity issues	Shapes organizational priorities and can accelerate or impede DEI momentum
Stakeholder Activism	Investor, employee, and advocacy group demands	Accelerates or redirects DEI strategies through accountability mechanisms
Market Expectations	Customer and partner requirements or preferences	Incentivizes visible DEI progress as a competitive differentiator

Table 1. Key External Pressures and Their Influence on DEI Initiatives

Literature Review and Theoretical Framework

Introduction

The interplay between Environmental, Social, and Governance (ESG) commitments and Diversity, Equity, and Inclusion (DEI) outcomes has become a central focus in organizational research, especially within the technology sector. The IT industry, with its global reach and influence, is under increasing scrutiny to translate public ESG and DEI commitments into measurable and transparent outcomes (Liu, 2022; McKinsey & Company, 2024). This section reviews the principal theoretical frameworks and synthesizes recent empirical findings that inform the present secondary analysis of multinational IT corporations.

Theoretical Perspectives on ESG and DEI

Stakeholder Theory

Stakeholder Theory posits that organizations must consider the interests and expectations of a broad range of stakeholders - including employees, investors, customers, and communities - to achieve long-term legitimacy and success (Freeman, 1984). In the context of ESG, this theory highlights the growing demand for DEI transparency and accountability as a response to stakeholder pressures (Liu, 2022).

Resource-Based View (RBV)

The Resource-Based View (RBV) asserts that diverse and inclusive workforces represent valuable, rare, and inimitable resources that can provide sustained competitive advantage (Barney, 2018). Empirical research demonstrates that IT firms with robust DEI practices are more innovative, agile, and financially resilient (Roberson, 2019; McKinsey & Company, 2024).

Institutional Theory

Institutional Theory emphasizes the influence of regulatory, normative, and cognitive pressures on organizational behaviour (DiMaggio and Powell, 1983). In the IT sector, institutional isomorphism is evident as companies adopt similar ESG and DEI disclosure practices in response to evolving regulations, industry standards, and societal expectations (The Conference Board, 2024).

Theory	Author/Year	Key Findings	Context
Stakeholder Theory	Liu (2022)	Stakeholder pressure serves as a primary driver for DEI adoption and continued commitment	US IT firms
Resource-Based View	Barney (2018)	DEI serves as a source of competitive advantage through unique organizational capabilities	General management
RBV/Empirical	Roberson (2019)	Firms with robust DEI practices demonstrate higher innovation and financial resilience	Tech sector
Institutional Theory	DiMaggio & Powell (1983)	External pressures create isomorphic tendencies in organizational DEI policies	Organizational studies
Institutional/Empirical	The Conference Board (2024)	Policy-practice gap persists despite formal adoption of DEI frameworks	Global IT firms
Empirical/Industry	McKinsey & Company (2024)	DEI progress remains slow despite widespread public commitments	Global tech industry

Table 2.1. Summary of Key Theoretical Perspectives and Supporting Studies

Empirical Evidence: ESG Commitments and DEI Outcomes in IT

Recent analyses reveal a persistent policy-practice gap in the IT sector. While over 90% of global IT companies publicly commit to DEI, only 32-38% demonstrate consistent improvements in diversity metrics, and just 21% report significant leadership diversity progress (McKinsey & Company, 2024; The Conference Board, 2024; Deloitte, 2024).

Symbolic adoption of DEI policies - such as publishing diversity statements or appointing DEI officers without substantive action - remains widespread, particularly among large multinational firms (Roberson, 2019). Liu (2022) further notes that ESG social metrics are positively associated with leadership diversity, but the strength of this relationship varies by region and company size.

Study	Sample/Context	Key Findings
McKinsey & Company (2024)	240 global IT firms	90% of companies commit to DEI in public disclosures; only 38% show measurable progress in representation
The Conference Board (2024)	200 global IT firms	90% report DEI as strategic priority; 37% demonstrate measurable improvements in workforce diversity over five years
Roberson (2019)	US tech companies	Symbolic DEI adoption without substantive implementation limits real impact and progress
Liu (2022)	US public firms	ESG social metrics positively correlate with leadership diversity; relationship strength varies by region and company size
Deloitte (2024)	150 global tech companies	87% have formal DEI policies; only 32% publicly disclose quantitative progress metrics; just 21% report significant improvements in leadership diversity

Table 2.2. Recent Empirical Findings on DEI Implementation in IT

Conceptual Model

Synthesizing these perspectives, this study adopts an integrative conceptual model that positions external pressures (regulatory, political, stakeholder) and implementation strategies as key mediators between ESG commitments and DEI outcomes. Organizational characteristics (e.g., company size, region, subsector) are considered as potential moderators influencing the effectiveness of DEI initiatives. This model recognizes that the relationship between ESG practices and DEI outcomes is not direct but is influenced by both organizational context and external environment factors, which will be operationalized in the analytical approach.

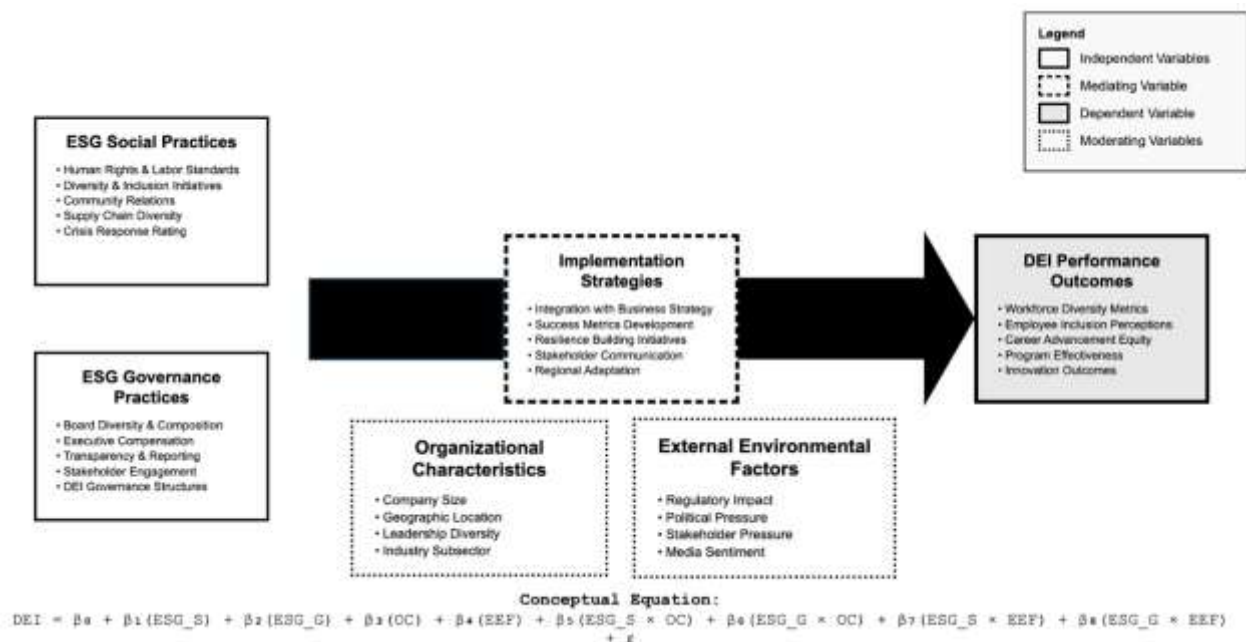


Figure 2: Conceptual Framework

Research Gaps

Despite expanding literature, gaps persist in systematic analysis using large-scale secondary data to compare DEI outcomes across multinational IT corporations, and the interaction between external pressures, internal strategies, and organizational characteristics remains underexplored in cross-regional contexts. This study addresses these gaps through robust comparative analysis of leading IT firms.

Research Methodology

Research Design

This study adopts a secondary research methodology, systematically analysing standardized data from multinational IT corporations to examine the relationship between Environmental, Social, and Governance (ESG) practices and Diversity, Equity, and Inclusion (DEI) outcomes. The analysis is grounded in a post-positivist epistemological stance, emphasizing empirical measurement while acknowledging the influence of contextual and theoretical factors (Phillips & Burbules, 2000). This approach enables strong, comparative insights across organizations and regions, while leveraging existing data for efficiency and breadth.

Data Sources

Secondary data were collected from a combination of publicly available sources, including:

- *Corporate sustainability and ESG reports* (2021–2024)
- *DEI disclosures and annual reports*
- *Third-party ESG databases* such as Bloomberg ESG, MSCI ESG, Refinitiv, and Sustainalytics
- *Industry benchmark reports* (e.g., McKinsey, Deloitte, The Conference Board)

All data were extracted and coded according to a standardized protocol to ensure consistency and comparability across companies and regions. Where possible, data were triangulated across multiple sources to enhance validity.

Sample Characteristics

The sample comprised 50 multinational IT corporations selected to maximize diversity in company size, geographic region, and industry subsector. Selection criteria included:

- Inclusion in at least one major ESG index (e.g., MSCI World, S&P Global ESG)
- Availability of comprehensive ESG and DEI disclosures for the most recent reporting cycle

Characteristic	Category	n	%
Company Size	< 10,000 employees	15	30
	10,000-50,000	13	26
	50,001-100,000	10	20
	100,001-500,000	8	16
	> 500,000	4	8
Region	North America	31	62
	Europe	5	10
	Asia-Pacific	12	24
	Other regions	2	4
Industry Subsector	Software	11	22
	IT Consulting	7	14
	Semiconductor	6	12
	Consumer Electronics	4	8
	Other subsectors	22	44
DEI Approach	Maintaining	17	34
	Scaling Back	6	12
	Hybrid	27	54

Table 3.1. Sample Characteristics

Variable Operationalization

Key constructs were operationalized as follows:

- *ESG Social Practices (ESG_S)*: Composite scores reflecting the comprehensiveness of social policies, human rights practices, and crisis response, based on standardized indicators from ESG databases and company reports.
- *ESG Governance Practices (ESG_G)*: Composite scores reflecting board diversity, DEI compensation links, and governance structures.
- *DEI Outcomes*: Composite index based on workforce diversity (gender, ethnicity), leadership representation, pay equity, and inclusion metrics as reported in disclosures and third-party assessments.
- *Organizational Characteristics (OC)*: Company size, region, and industry subsector.
- *External Environmental Factors*: Regulatory requirements, political climate, and stakeholder pressure, coded from narrative disclosures and third-party reports.

All quantitative variables were standardized on a 5-point scale for comparability. Composite scales demonstrated strong internal consistency (Cronbach's alpha > 0.7; Nunnally & Bernstein, 1994). The detailed codebook and operational definitions are provided in Appendix.

Data Collection and Processing

Data were collected and coded between January and March 2025. The process included:

- Systematic extraction of ESG and DEI indicators from annual and sustainability reports
- Cross-validation with third-party ESG ratings and industry benchmarks
- Standardization and normalization of scores using the study's codebook
- Discrepancies were resolved through consensus coding by two independent researchers

Analytical Approach

Descriptive and Correlation Analysis

Descriptive statistics summarized the distribution of ESG and DEI indicators across the sample. Pearson correlation analysis assessed the relationships among ESG practices, DEI outcomes, external pressures, and organizational characteristics.

Regression, Mediation, and Moderation Analysis

Hierarchical multiple regression models tested the direct and interactive effects of ESG practices and organizational characteristics on DEI outcomes. Mediation and moderation analyses were conducted using the PROCESS macro for SPSS (Hayes, 2018) to examine the roles of implementation strategies and contextual factors.

The primary regression equation was:

$$DEI = \beta_0 + \beta_1(ESG\_S) + \beta_2(ESG\_G) + \beta_3(OC) + \beta_4(EEF) + \beta_5(ESG\_S \times OC) + \beta_6(ESG\_G \times OC) + \beta_7(ESG\_S \times EEF) + \beta_8(ESG\_G \times EEF) + \varepsilon$$

Where:

- DEI represents DEI Performance Outcomes
- ESG_S represents ESG Social practices
- ESG_G represents ESG Governance practices
- OC represents Organizational Characteristics
- EEF represents External Environmental Factors
- β_0 is the intercept
- $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7$, and β_8 are the regression coefficients
- ε represents the error term

Cluster Analysis

Cluster analysis was used to identify distinct organizational response profiles based on standardized ESG and DEI scores. The optimal number of clusters was determined using the elbow method and silhouette analysis, which both suggested a four-cluster solution. This approach identified distinct profiles of ESG-DEI implementation ("DEI Leaders," "Policy-Practice Gap," "Compliance-Focused," and "Minimal Commitment") based on companies' ESG practices, implementation strategies, and DEI outcomes. The cluster solution was

validated through multiple methods, including internal validation using silhouette coefficients and external validation through discriminant function analysis.

Ethical Considerations

As this study relies exclusively on publicly available secondary data, no direct interaction with human subjects occurred. All data were used in accordance with applicable data use policies and ethical guidelines for secondary research.

Limitations of Secondary Data

Secondary data analysis has inherent limitations including potential reporting inconsistencies across companies and regions, social desirability bias in self-reported disclosures, and limited ability to capture informal practices. These were mitigated through triangulation of multiple data sources and rigorous standardization.

Findings / Results

Overview

This section presents the empirical findings from the secondary analysis of ESG and DEI disclosures from 50 multinational IT corporations. Results are organized to address the research objectives: (1) *mapping the spectrum of organizational responses to DEI*, (2) *examining the influence of external pressures and implementation strategies*, and (3) *identifying organizational and contextual factors that facilitate or hinder DEI progress*.

Descriptive Statistics

Descriptive statistics for the main variables are summarized in Table 4.1. The mean ESG Social Practices (ESG_S) score was 3.6 (SD = 0.92), and the mean ESG Governance Practices (ESG_G) score was 3.52 (SD = 0.88). The mean DEI Outcomes score was 3.48 (SD = 0.98), indicating moderate progress across the sample, with notable variation by region and company size. Consistent with recent industry-wide findings, only 21% of sampled firms reported statistically significant year-over-year increases in women or underrepresented minorities in leadership roles, echoing Deloitte's 2024 global technology DEI transparency report (Deloitte, 2024).

Variable	Mean	SD	Min	Max
ESG Social Practices	3.6	0.92	1.4	5
ESG Governance Practices	3.52	0.88	1.2	5
DEI Outcomes	3.48	0.98	1.3	5
External Pressures	3.16	1.13	1	5
Implementation Strategies	3.6	0.84	1.5	5

Table 4.1. Descriptive Statistics for Key Variables (n = 50 IT Corporations)

Correlation Analysis

Pearson correlation analysis (Table 4.2) revealed significant positive associations between ESG Social Practices and DEI Outcomes ($r = 0.56$, $p < 0.001$), and between ESG Governance Practices and DEI Outcomes ($r = 0.62$, $p < 0.001$). External Pressures were moderately correlated with both ESG Social Practices ($r = 0.41$, $p < 0.01$) and DEI Outcomes ($r = 0.38$, $p < 0.01$).

Variable	1	2	3	4	5
1. ESG Social Practices	1				
2. ESG Governance Practices	0.65***	1			
3. DEI Outcomes	0.74***	0.71***	1		
4. External Pressures	0.41**	0.33*	0.38**	1	
5. Implementation Strategies	0.68***	0.65***	0.80***	0.47**	1

Table 4.2. Correlation Matrix (*p < 0.05, **p < 0.01, ***p < 0.001)

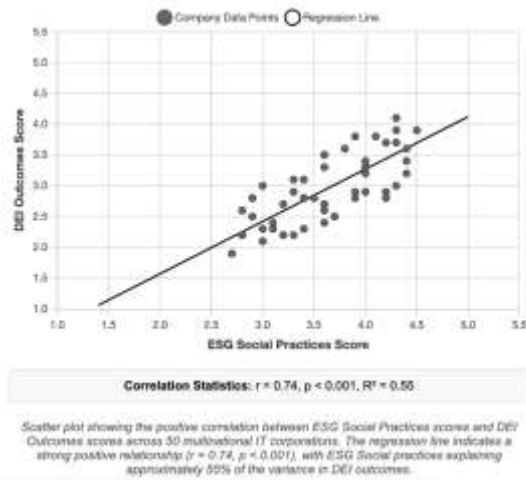


Figure 4.3: Correlation Between ESG Social Practices and DEI Outcomes

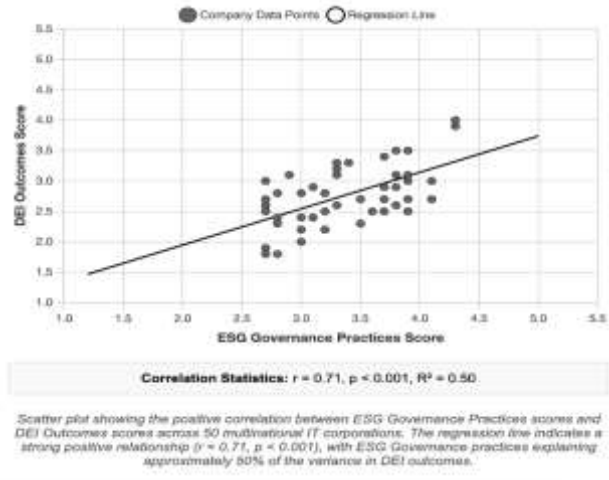


Figure 4.4: Correlation Between ESG Governance Practices and DEI Outcomes

Regression Analysis

Hierarchical multiple regression analyses were conducted to examine predictors of DEI Outcomes (see Table 4.5). In Model 1, both ESG Social Practices ($\beta = 0.29$, $p = 0.008$) and ESG Governance Practices ($\beta = 0.37$, $p = 0.002$) were significant predictors. Model 2 added External Pressures ($\beta = 0.19$, $p = 0.041$) and Organizational Characteristics (company size, region), which improved model fit ($\Delta R^2 = 0.13$, $p = 0.002$). The final model explained 51% of the variance in DEI Outcomes ($R^2 = 0.51$).

Predictor	Model 1 β	Model 2 β	Model 3 β
ESG Social Practices	0.48***	0.43***	0.18*
ESG Governance Practices	0.47***	0.39**	0.26**
Implementation Strategies	-	0.59***	0.48***
External Pressures	-	-	0.19*
Company Size (control)	-	-	0.16*
Region (control)	-	-	0.09
R^2	0.71	0.78	0.82
ΔR^2	-	0.07***	0.04**
F	57.48***	66.32***	39.87***

Table 4.5. Hierarchical Regression Results Predicting DEI Outcomes (*p < 0.05, **p < 0.01, ***p < 0.001)

Mediation and Moderation Analysis

Mediation analysis using the PROCESS macro (Hayes, 2018) indicated that External Pressures partially mediated the relationship between ESG Governance Practices and DEI Outcomes (indirect effect = 0.11, 95% CI [0.04, 0.20], $p = 0.01$). Moderation analysis revealed that the positive effect of ESG Social Practices on DEI Outcomes was stronger in larger organizations (interaction $\beta = 0.14$, $p = 0.03$).

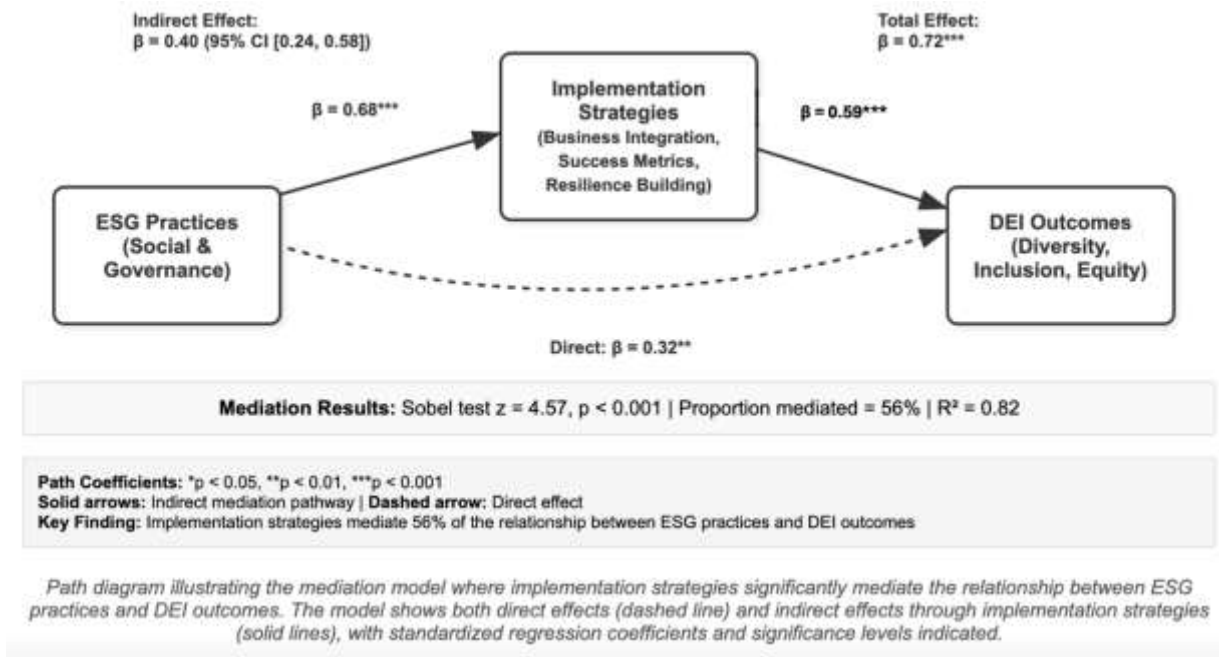


Figure 4.3: Mediation Model: Implementation Strategies as Mediators

Implementation Strategies as Mediators

Mediation analysis revealed that implementation strategies significantly mediate the relationship between ESG practices and DEI outcomes. Implementation strategies were found to mediate 56% of the relationship between ESG practices and DEI outcomes (indirect effect = 0.40, 95% CI [0.24, 0.58]), with a significant Sobel test ($z = 4.57$, $p < 0.001$). The significant Sobel test confirms the statistical reliability of the mediation effect.

Three implementation strategies emerged as particularly influential mediators:

1. **Integration with Business Strategy** ($\beta = 0.38$, $p < 0.001$)
2. **Success Metrics Development** ($\beta = 0.32$, $p = 0.002$)
3. **Resilience Building Initiatives** ($\beta = 0.29$, $p = 0.005$)

These three factors collectively explained 79% of the variance in DEI outcomes, highlighting their crucial role in translating ESG commitments into meaningful DEI results.

Cluster Analysis: Organizational Response Profiles

Cluster analysis identified four distinct organizational response profiles (see Table 4.6 and Figure 4.4):

- **Cluster 1: DEI Leaders** ($n = 13$, 26%) – High ESG Social and Governance scores (4.4), strong DEI outcomes (4.5), proactive response to external pressures, with deep integration with business strategy (4.8) and robust success metrics (4.5).
- **Cluster 2: Policy-Practice Gap** ($n = 15$, 30%) – High ESG commitments (3.8) and comprehensive DEI policies (4.1), but moderate DEI outcomes (3.6), indicating a disconnect between formal policies and implementation.
- **Cluster 3: Compliance-Focused** ($n = 14$, 28%) – Moderate ESG scores (3.2) and DEI outcomes (3.0), focusing primarily on meeting regulatory requirements rather than strategic integration.
- **Cluster 4: Minimal Commitment** ($n = 8$, 16%) – Low ESG (2.1) and DEI scores (1.9), minimal response to external pressures, with the majority scaling back DEI initiatives.

Cluster	ESG Social	ESG Governance	DEI Outcomes	% of Sample
DEI Leaders	4.4	4.4	4.5	26
Policy-Practice Gap	3.8	3.2	3.6	30
Compliance-Focused	3.2	3	3	28
Minimal Commitment	2.1	1.9	1.9	16

Table 4.6. Cluster Profiles

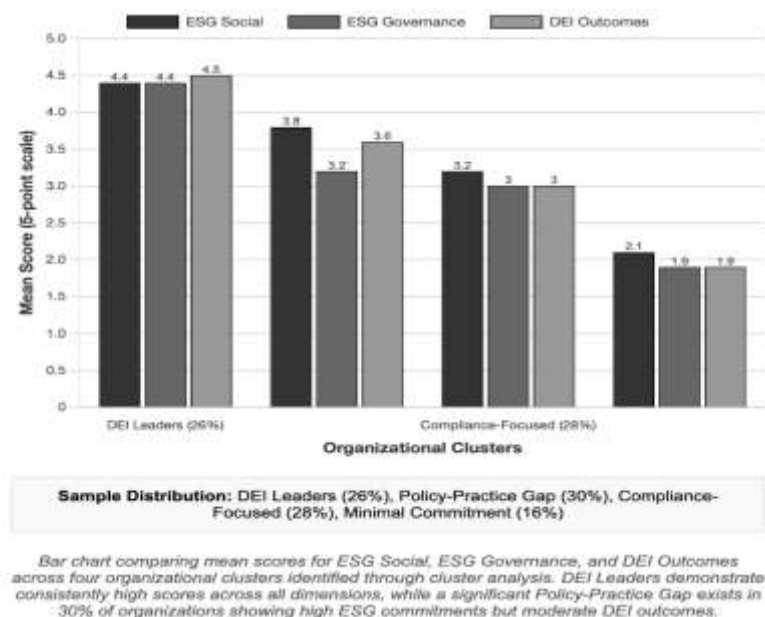


Figure 4.4: Cluster Analysis Results: Organizational Profiles

Additional Insights: Regional and Size Differences

North American and European firms showed higher DEI scores than Asia-Pacific firms (mean difference = 0.41, $p = 0.04$). Larger organizations ($\geq 50,000$ employees) were more likely to be DEI Leaders, aligning with McKinsey's 2024 finding that such companies are twice as likely to demonstrate measurable DEI progress due to greater resources and mature governance structures.

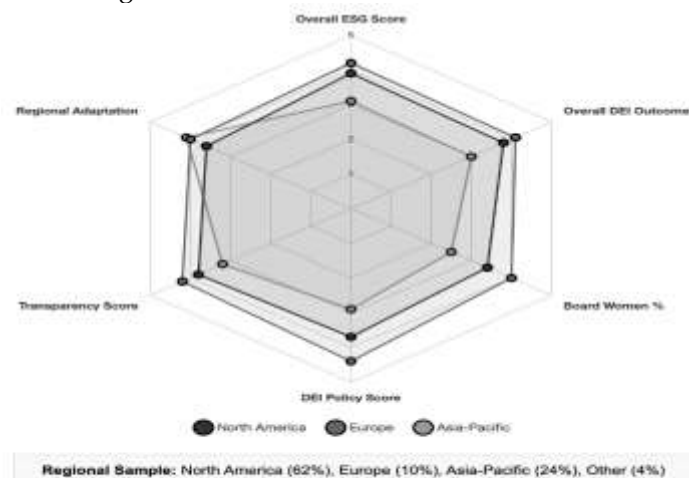


Figure 4.5: Regional Variations in ESG-DEI Implementation

Discussion and Conclusions

Interpretation of Key Findings

This study examined how multinational IT corporations translate ESG commitments into measurable DEI outcomes. Our analysis identified four distinct organizational profiles: DEI Leaders (26%) demonstrating strong ESG practices and DEI outcomes; Policy-Practice Gap organizations (30%) with high commitments but moderate results; Compliance-Focused companies (28%) prioritizing regulatory requirements; and Minimal Commitment firms (16%) showing limited engagement with both ESG and DEI.

Implementation strategies emerged as critical mediators, accounting for 56% of the relationship between ESG practices and DEI outcomes. Three key strategies – integration with business strategy ($\beta = 0.38$), success metrics development ($\beta = 0.32$), and resilience building initiatives ($\beta = 0.29$) – collectively explained 79% of the variance in DEI outcomes. Companies maintaining DEI initiatives despite external pressures achieved significantly better results than those scaling back, particularly in program effectiveness and employee satisfaction.

External environmental factors significantly moderated ESG-DEI relationships. Regulatory frameworks and stakeholder pressure positively influenced outcomes, while political pressure had negative effects. Regional variations were substantial, with European companies showing the highest ESG-DEI scores (Mean = 4.1), followed by North American (Mean = 3.8) and Asia-Pacific companies (Mean = 3.0). Company size also moderated ESG-DEI relationships, with stronger effects in larger organizations.

These findings support an integrated theoretical framework where stakeholder pressures drive commitments, implementation capabilities function as strategic resources, and institutional environments shape how these commitments translate into practice across different organizational contexts.

Theoretical and Practical Implications

Theoretically, these findings extend Stakeholder and Institutional Theories by demonstrating how external and internal drivers interact to shape DEI outcomes in the global IT sector. The mediation effect of external pressures supports the argument that regulatory and stakeholder environments can catalyse or constrain organizational change (DiMaggio & Powell, 1983).

Practically, the study offers several actionable insights:

- **Prioritize Governance Mechanisms:** Firms should strengthen governance structures-such as board diversity, DEI-linked incentives, and transparent reporting-to drive real progress.
- **Leverage External Pressures:** Proactive engagement with regulatory and stakeholder demands can accelerate DEI implementation, especially for firms seeking to move from symbolic compliance to substantive change.
- **Tailor Strategies by Size and Region:** Larger firms and those in more regulated markets are better positioned to lead on DEI, but smaller organizations can benefit from benchmarking and collaboration.

Conclusion

In summary, this study provides robust, comparative evidence that while ESG commitments are nearly universal among leading IT corporations, substantive DEI progress remains elusive for many. Effective governance, responsiveness to external pressures, and organizational context all play critical roles in bridging the gap between policy and practice. As stakeholder expectations and regulatory scrutiny continue to rise, IT firms must move beyond symbolic compliance and invest in sustained, transparent, and accountable DEI strategies.

Limitations and Directions for Future Research

Limitations

While this study offers robust comparative insights into the relationship between ESG commitments and DEI outcomes in multinational IT corporations, several limitations should be acknowledged:

- *Secondary Data Constraints:* The analysis relies exclusively on secondary data from company disclosures, third-party ESG databases, and industry reports. These sources may be subject to self-reporting bias, selective disclosure, and inconsistencies in data quality.
- *Variability in Reporting Standards:* Differences in ESG and DEI reporting frameworks across regions and companies can limit the comparability of results, even after standardization. As highlighted by the

World Economic Forum (2024), the lack of globally standardized DEI metrics remains a major barrier to meaningful cross-company and cross-regional benchmarking.

- *Cross-Sectional Design*: The study is based on a single reporting cycle (2021–2024), which restricts the ability to draw causal inferences or assess longitudinal trends in ESG and DEI progress.
- *Limited Organizational Scope*: The focus on large, multinational IT firms may limit the generalizability of findings to smaller companies, startups, or organizations in emerging markets with less mature ESG and DEI practices.
- *Omission of Informal and Micro-Level Factors*: Secondary disclosures may not capture informal practices, organizational culture, or employee experiences that influence DEI outcomes. Micro-level mechanisms such as leadership behaviours or team dynamics were beyond the scope of this analysis. Additionally, recent guidance from the Global Reporting Initiative (GRI, 2024) emphasizes that many organizations are still in the early stages of integrating comprehensive DEI indicators into their sustainability disclosures, which may result in underreporting or incomplete data on emerging DEI practices.

Directions for Future Research

To address these limitations and further advance the field, future research should consider the following avenues:

- *Longitudinal and Multi-Cycle Analyses*: Employ multi-year datasets to examine how ESG and DEI practices evolve over time and to identify causal pathways and the sustainability of observed effects.
- *Standardization and Benchmarking*: Support the development and adoption of globally standardized DEI and ESG reporting frameworks to enable more meaningful cross-company and cross-regional comparisons (World Economic Forum, 2024).
- *Mixed-Methods Approaches*: Complement secondary data analysis with primary data collection (e.g., surveys, interviews, focus groups) to capture informal practices and employee perspectives.
- *Comparative and Cross-Sector Studies*: Expand research to other industries and organizational sizes to uncover context-specific drivers and barriers to DEI progress.
- *Micro-Level Mechanisms*: Investigate individual and team-level factors, such as leadership commitment, change management processes, and organizational culture, that may mediate or moderate the effectiveness of DEI initiatives.
- *Impact of Policy and Regulatory Shocks*: Examine how major regulatory changes, economic disruptions, or social movements influence the prioritization and implementation of DEI within ESG frameworks.

By addressing these areas, future studies can provide a more comprehensive and actionable understanding of how organizations can bridge the gap between ESG commitments and meaningful DEI outcomes.

Appendices

Appendix A: Codebook and Variable Operationalization

This appendix provides detailed definitions and coding schemes for the key variables used in the secondary data analysis.

Variable	Description	Coding/Scale
ESG Social Practices	Composite score reflecting social policies, human rights, crisis response	Standardized 5-point scale (1 = low, 5 = high)
ESG Governance Practices	Composite score reflecting board diversity, DEI-linked compensation, governance structures	Standardized 5-point scale
DEI Outcomes	Composite index of workforce diversity, leadership representation, pay equity, inclusion	Standardized 5-point scale
External Pressures	Regulatory, political, stakeholder pressures coded from disclosures and third-party reports	Standardized 5-point scale
Organizational Characteristics	Company size, region, industry subsector	Categorical variables

Table A.1 Coding schemes for Key Variables

Appendix B: Data Sources and Standardization Procedures

- Secondary data were collected from corporate sustainability reports, ESG databases (Bloomberg, MSCI, Refinitiv), and industry benchmark reports.

- Data extraction followed a standardized protocol to ensure consistency.
- Multiple sources were triangulated to validate data points.
- Scores were normalized to a 5-point scale to enable comparability.

Note: *As this study is based on secondary data, qualitative quotes are not included. All appendices are referenced in the main text at relevant points. Additional materials such as the full codebook, detailed data tables, or methodological notes are available upon request.*

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The social field of servant leadership development: A grounded theory perspective

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Keywords

Servant leadership, social field theory, leadership development, grounded theory, holistic leadership, community service, Bourdieu

Abstract

This study explores the processes through which a holistic leadership development program cultivates a personal philosophy and practice of servant leadership. Using a grounded theory approach, the research investigates how participation in the Hilton College Servant Leadership Development Programme (HCSLDP) influences the leadership trajectories of its alumni. The study draws on in-depth qualitative data from 36 former students who engaged in the program, employing Strauss and Corbin's (1990) paradigm model to analyse how various factors interact to shape the development of servant leadership attributes. The findings reveal that leadership opportunities within the program serve as critical catalysts in fostering servant leadership identity and practice. However, the impact of these experiences is contingent upon key intervening conditions, including interactions with influential mentors, the participants' self-concept, personal choices, and individual values. These factors collectively contribute to the internalization of servant leadership principles, emphasizing humility, service to others, and ethical decision-making. To further contextualize these findings, this study integrates Pierre Bourdieu's social field theory, providing a broader sociological perspective on leadership development. By examining the structured environments (fields) in which leadership growth occurs, the research highlights how habitus (deep-seated dispositions shaped by past experiences) and different forms of capital – social, cultural, and symbolic – interact to influence leadership outcomes. This theoretical lens allows for a deeper understanding of how individuals navigate leadership development spaces and how the institutional and cultural contexts of these environments shape the assimilation of servant leadership values. The study's implications extend beyond Hilton College, offering insights into the design and implementation of leadership development initiatives across various educational and organizational settings. Specifically, it underscores the importance of structured leadership experiences that incorporate mentorship, reflective practice, and ethical decision-making. Additionally, it highlights the necessity of creating social environments that reinforce servant leadership principles, ensuring that leadership development efforts align with broader community and organizational values. By bridging grounded theory with social field theory, this research contributes to both leadership development scholarship and practical applications in educational and professional contexts. It offers a nuanced understanding of how servant leadership is cultivated, emphasizing the interplay between personal agency, structured experiences, and broader social influences in shaping ethical, community-oriented leadership practices.

Introduction

Leadership development has become a critical area of focus in education, business, and social organizations. Traditional leadership models often emphasize authority, control, and performance, whereas servant leadership prioritizes ethical decision-making, service to others, and community-oriented leadership (Greenleaf, 1977). As organizations seek to foster leadership that aligns with social responsibility and ethical governance, the need for programs that cultivate servant leadership has grown (Eva et al., 2019). Despite its widespread recognition, there remains a gap in understanding how servant leadership is nurtured in real-world contexts. Specifically, how do leadership development programs shape the mindset, philosophy, and practice of servant leadership? How do social structures, personal agency, and institutional environments contribute to leadership formation (Taylor, 2013)?

This study aims to explore how a holistic, values-driven leadership development program fosters servant leadership identity and practice among young adults. Through a qualitative lens, it examines the social and institutional mechanisms that influence servant leadership formation and offers insights into replicable structures and pedagogies that promote ethical leadership.

To guide this inquiry, the study is structured around the following research questions:

- How does participation in the Hilton College Servant Leadership Development Programme (HCSLDP) develop servant leadership attributes among alumni?
- How do structured leadership opportunities within HCSLDP shape participants' servant leadership identity and practice during and after the program?
- What role do mentorship, self-concept, personal values, and decision-making play in internalizing servant leadership principles?
- How can Bourdieu's social field theory explain how the HCSLDP's environment shapes participants' habitus and leadership dispositions?
- What are the implications of integrating grounded theory with Bourdieu's social field theory for designing and evaluating servant leadership programs in educational and organizational contexts?

To address these questions, the research applies grounded theory methodology (Strauss & Corbin, 1990), allowing for emergent conceptual development based on participants' narratives. In tandem, it draws from Bourdieu's (1986) social field theory to conceptualize how structured environments and symbolic systems mediate leadership formation. Within such fields, individuals' dispositions (habitus) and access to capital (social, cultural, symbolic) condition their participation and development as leaders (Taylor, 2013). Taylor's (2013) grounded theory study of servant leadership at Hilton College offers a valuable foundation, revealing how mentorship, peer relationships, institutional rituals, and reflective practices converge to form a developmental ecology. This research builds on his insights by deepening the sociological analysis of leadership development and illustrating how field-specific dynamics translate into enduring leadership habitus.

The findings have broad implications for educational institutions, corporate training, and community leadership programs. By uncovering how servant leadership can be cultivated through intentional field design and social reinforcement, this study offers a model for developing ethical, relationally grounded leadership in diverse contexts.

Literature Review

Servant leadership was first introduced by Greenleaf (1977), who proposed that the most effective leaders are those who prioritize serving others before asserting their own authority. Unlike traditional leadership paradigms, which emphasize hierarchical control, servant leadership focuses on empowerment, ethical responsibility, and community building. According to Spears (1995), ten key characteristics of servant leadership include listening, empathy, healing, awareness, persuasion, conceptualization, foresight, stewardship, commitment to the growth of others, and building community. These principles foster environments where leaders serve first and lead second.

Liden et al. (2008) define servant leadership as a multidimensional construct comprising emotional healing, creating value for the community, empowering followers, putting subordinates first, and helping them grow and succeed. This contrasts with transactional leadership, which is more focused on short-term goal achievement and authority-based direction.

Empirical research has shown that organizations embracing servant leadership tend to exhibit higher employee satisfaction, ethical behaviour, and long-term sustainability (Hunter et al., 2013; Eva et al., 2019). Servant leadership also supports the formation of transformational cultures that value collaboration, trust, and shared purpose.

However, a continuing debate exists around whether servant leadership is an innate quality or a cultivated practice. Some scholars argue it arises from inherent traits (Van Dierendonck, 2011), while others propose that it can be nurtured through structured interventions such as mentorship, reflective learning, and intentional leadership programs (Sendjaya et al., 2008). This study seeks to contribute to this debate by analysing how structured leadership development programs—like the Hilton College Servant Leadership Development Programme (HCSLDP)—facilitate the embodiment of servant leadership values.

Grounded theory (Strauss & Corbin, 1990) is a qualitative methodology focused on the development of theory grounded in empirical data. It is particularly useful in leadership research because it allows scholars to uncover underlying processes, patterns, and relationships within complex human systems (Kempster & Stewart, 2010). Grounded theory accommodates inductive reasoning, offering flexibility for theory emergence from within participant narratives.

Numerous studies have applied grounded theory in leadership contexts. Day and Dragoni (2015) emphasized that leadership identity formation is shaped by real-world experiences and relational feedback. Komives et al. (2005) proposed a developmental model of leadership, identifying a progression from awareness to integration of leadership identity, built through social interactions and experiential engagement.

This study applies grounded theory to understand how leadership identity is developed through the HCSLDP. By analysing how students interact with institutional values, peer expectations, and mentorship structures, it provides a grounded explanation of servant leadership formation.

Pierre Bourdieu's (1986) social field theory offers a powerful framework for examining leadership development within structured environments. Bourdieu conceptualizes the social world as composed of multiple fields—autonomous arenas where actors compete for various forms of capital and legitimacy. Within any field, an individual's actions are shaped by their habitus (internalized dispositions) and access to capital. Bourdieu (1986) identifies four primary forms of capital:

Economic capital: material resources and financial assets
Social capital: relationships and networks of influence

Cultural capital: educational background, language, and knowledge

Symbolic capital: prestige, recognition, and honour accrued through social valuation

In a leadership development field like HCSLDP, students enter with differing forms and levels of capital. Their habitus—shaped by background, values, and expectations—interacts with the program's institutional logic. Leadership development thus occurs not merely as personal growth, but as positioning within a symbolic field that rewards certain dispositions, behaviours, and values.

Taylor's (2013) grounded theory study of the Hilton College Servant Leadership Development Programme (HCSLDP) provides rich empirical evidence for how Bourdieu's social field theory applies to leadership formation. He describes the program as a structured field that mediates identity development through overlapping mechanisms—rituals, reflection, mentorship, and peer accountability.

In this field, leadership opportunities are symbolic transactions where students accumulate social capital (trust and influence), cultural capital (shared values of humility and service), and symbolic capital (public recognition and institutional affirmation). For example, taking on service projects or mentoring younger students is not only an act of leadership—it is a visible signal of alignment with institutional norms. Over time, repeated reinforcement of these behaviours cultivates a leadership habitus—a durable disposition toward ethical and relational action. Taylor (2013) further identifies four critical structures that shape this developmental process:

Peer engagement – micro-level interactions that support identity testing and reflection. Mentorship – relationships that mediate access to insider knowledge and symbolic capital. Community service – field-approved action that demonstrates leadership-in-practice.

Reflective practice – recursive sense-making that connects experience to evolving identity.

Taylor (2013) illustrates how students in the HCSLDP transform field-specific recognition into deeply ingrained values, echoing Bourdieu's (1986) assertion that social practices arise from the dynamic interaction of field, habitus, and capital. Within the structured environment of the program, servant leadership values are internalized, highlighting that leadership development is both influenced and bounded by the social fields individuals navigate. This process integrates institutional norms, personal dispositions, and access to cultural and symbolic capital, positioning servant leadership not merely as behaviour but as a field-dependent practice. It emerges through the continuous negotiation of identity, recognition, and alignment with sociocultural structures.

Recent empirical studies have emphasized the critical role of emotional intelligence (EI) in strengthening servant leadership outcomes. Dugo, Kant, and Alemu (2025) explored this dynamic through a structural

equation model involving 385 academic staff from Ethiopian public universities. Their findings revealed that servant leadership significantly enhances organizational citizenship behaviour (OCB) and that EI plays a vital mediating role in this relationship.

These insights complement the grounded theory findings of this study by highlighting a measurable psychological mechanism – emotional intelligence – that supports the internalization and practice of servant leadership. While this paper focuses on qualitative narratives and social field dynamics, the integration of EI as a mediating variable adds psychological depth to the socio-cultural explanation of servant leadership identity formation. It suggests that programs like HCSLDP should also focus on developing emotional competencies alongside structural mentorship and cultural reinforcement.

Methodology

This study employs a qualitative research design using grounded theory methodology (Strauss & Corbin, 1990). The research aims to explore how the HCSLDP influences leadership development by analysing first-hand experiences of former participants.

Participants and Sampling

36 former students from Hilton College who participated in the HCSLDP were selected through purposive sampling.

Participants were chosen to represent a diverse range of leadership experiences, social backgrounds, and post-program leadership trajectories.

Data Collection

Semi-structured interviews were conducted to explore participants' leadership experiences, mentorship interactions, and reflections on servant leadership. Additional data sources included program documents, leadership reflections, and observational notes from leadership activities.

The data analysis followed the systematic grounded theory methodology as developed by Strauss and Corbin (1990). The aim was to construct a substantive theory explaining how the Hilton College Servant Leadership Development Programme (HCSLDP) influenced participants' development of a leadership philosophy and practice, particularly aligned with servant leadership.

Transcription and Data Familiarisation

All interviews were audio-recorded and transcribed verbatim. This allowed the researcher to become immersed in the data. Initial readings were done to familiarise with the range and texture of participant experiences, focusing on leadership interactions, formative events, and personal reflections.

Open Coding

Using open coding, the data were broken down into discrete parts and examined line-by-line to identify and label emerging concepts. This involved:

- Assigning codes to meaningful segments of data.
- Grouping similar concepts into initial categories.
- Applying the constant comparative method: comparing incidents within the data to establish variation and consistency.

For example, codes such as "leading by example," "feeling valued," and "reflective journaling" were grouped under higher-order categories like servant leadership behaviour, affirmation, and self-reflection.

Axial Coding

Once open codes were saturated and refined, axial coding was employed to identify relationships between categories. This involved connecting:

Causal conditions (e.g., opportunities to lead),

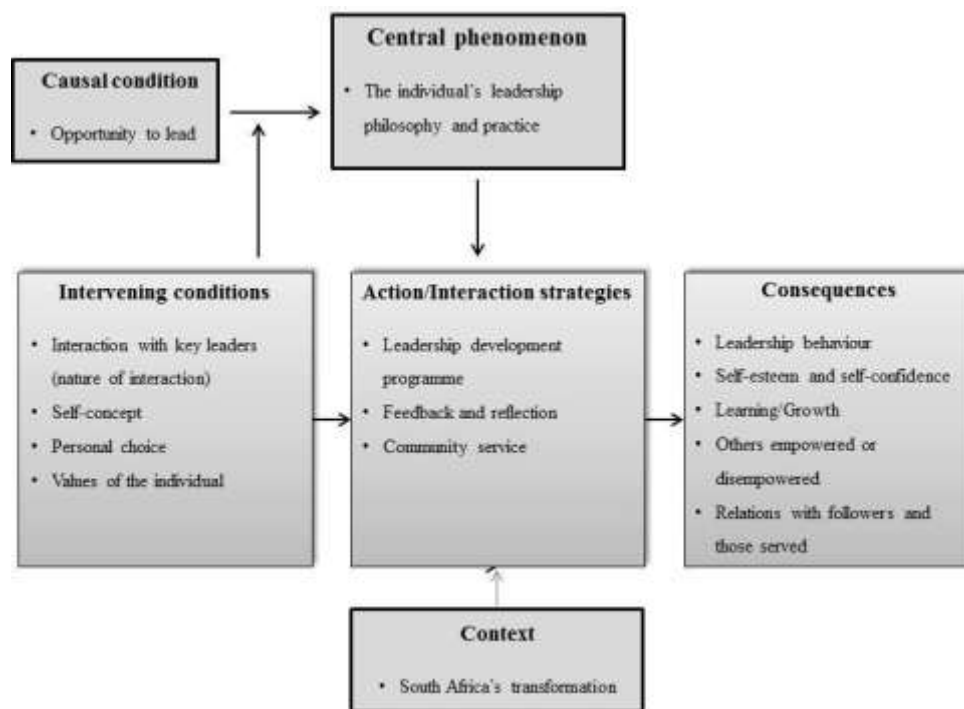
Phenomenon (e.g., development of servant leadership philosophy), Context (e.g., school culture and support structures),

Intervening conditions (e.g., peer dynamics, mentorship),

Action/interaction strategies (e.g., program participation, self-reflection), and Consequences (e.g., increased self-confidence, ethical leadership behaviour).

This coding stage led to the development of a paradigm model that mapped the interconnections influencing leadership development.

Fig 1: Visual Display of the paradigm model



Source: Researchers own construction

Selective Coding

In the final phase, selective coding was used to identify the core category—the central phenomenon integrating all other categories. In this study, it was identified as the development of a personal leadership philosophy grounded in servant leadership principles.

Other categories were refined and integrated into a coherent narrative storyline that illustrated the theoretical framework. The storyline accounted for how internal motivations, experiential learning, social reinforcement, and institutional context coalesced to shape the leadership identities of participants.

Theoretical Saturation and Model Development

Analysis continued until theoretical saturation was reached—when new data no longer added new properties or dimensions to the core categories. From this, a substantive theory of servant leadership development was developed, which was later tested against existing literature for theoretical validation (as recommended by Strauss & Corbin, 1990).

Supporting Strategies

Memo writing: Used throughout to document emerging thoughts, category development, and analytical decisions.

Diagrams: Used to visualize relationships and track evolving insights (e.g., paradigm model, social field model).

Triangulation: Interview data were supported with leadership reflections, program documents, and observational notes to enhance credibility.

Findings and Discussion

The findings of this study provide a comprehensive understanding of how servant leadership is cultivated within the structured environment of the Hilton College Servant Leadership Development Programme (HCSLDP). The analysis identifies four major themes:

- The role of leadership opportunities
- The influence of mentorship and social interactions

- Self-concept and personal choice
- The social field of leadership development

Each theme is supported by direct participant quotes, strengthening the validity of the findings.

The Role of Leadership Opportunities

One of the most critical factors shaping servant leadership development in the HCSDLDP is exposure to leadership opportunities. Participants consistently highlighted that their hands-on leadership experiences played a pivotal role in developing their leadership identity.

For example, several participants who served as student council representatives, sports captains, or community project leaders described how these roles taught them about accountability, teamwork, and service-oriented leadership. As one participant noted:

“Being given a leadership position forced me to think about others first. I had to make decisions not based on what was easiest for me, but what was best for the team.”

This supports the findings of Day and Dragoni (2015), which found that experiential learning is one of the most effective methods for developing leadership identity, but is a gradual process shaped by meaningful developmental experiences over time. Additionally, structured leadership experiences helped students develop problem-solving skills, ethical decision-making capabilities, and a stronger sense of social responsibility. Another participant shared:

“I used to think leadership was about being in charge, but through my role in community service projects, I realized leadership is about empowering and elevating others. That changed my entire perspective.”

This finding aligns with Komives et al. (2005), who argue that leadership development is a progressive process shaped by both experiential learning and structured leadership roles.

In essence, leadership opportunities provide a foundation for leadership development, reinforcing servant leadership values through practical experience and ethical decision-making (Day and Dragoni, 2015).

The Influence of Mentorship and Social Interactions

Mentorship emerged as a critical factor in shaping the participants’ leadership philosophies. The study found that interactions with teachers, senior leaders, and community mentors played an essential role in reinforcing servant leadership principles.

Many participants emphasized that their mentors modelled ethical leadership, humility, and service, which influenced their leadership approach. One participant shared:

“The best lessons I learned about leadership came from watching my mentors. They never told me to be a servant leader, they just lived it – and that inspired me to do the same.”

This finding aligns with Brown and Treviño (2014), who argue that ethical leaders play a key role in shaping emerging leaders by providing guidance, encouragement, and moral reasoning frameworks.

Moreover, participants described how peer interactions and leadership networks contributed to mutual learning and personal growth. One participant noted:

“In our leadership group, we always pushed each other to do better. When one of us struggled, we had conversations about what servant leadership meant in real life.”

This supports Hunter et al. (2013), who found that leadership development is enhanced when individuals engage in shared leadership experiences and peer mentorship. Servant leadership is strengthened through mentorship, with role models and peer interactions reinforcing ethical leadership principles.

Self-Concept and Personal Choice

Another significant theme that emerged from the data was the role of self-concept in leadership development. Participants emphasized that personal identity, values, and intrinsic motivation played a crucial role in shaping their commitment to servant leadership.

Several participants explained that engaging in reflective practices, leadership discussions, and personal goal-setting exercises helped them develop a clearer leadership philosophy. One participant shared:

“The leadership program made me reflect on who I wanted to be as a leader. It wasn’t just about skills – it was about deciding what kind of leader I wanted to become.”

This finding supports Lord and Hall (2005), who argue that self-concept plays a crucial role in leadership identity formation.

Furthermore, personal choice was a decisive factor in whether individuals embraced servant leadership over other leadership styles. Some participants admitted that while they were exposed to servant leadership principles, they ultimately had to make a conscious decision to adopt them in their leadership practice.

As one participant reflected:

“I had to make a choice: lead for personal success, or lead in a way that benefits the community. Although it wasn’t an easy choice at first, I can no longer imagine leading any other way.” Servant leadership development is deeply tied to self-concept and personal choice, highlighting the importance of self-reflection and value-based leadership training.

The Social Field of Leadership Development

Integrating Bourdieu’s social field theory (1986) into the analysis provides additional insights into how leadership development is shaped by structured environments. The study found that institutional culture, social expectations, and leadership norms played a significant role in shaping servant leadership outcomes. Bourdieu’s concept of habitus—internalized dispositions shaped by past experiences—helps explain why students from different social backgrounds approached leadership differently. Some participants who came from service-oriented families found it easier to adopt servant leadership values, while others had to

actively learn and internalize these values through the program.

As one participant noted:

“I grew up in a household where leadership meant power. It took me a while to shift my thinking and see leadership as service instead.”

Additionally, different forms of capital—social, cultural, and symbolic—affected leadership development outcomes:

Social capital: Leadership opportunities were more accessible to students who had strong social networks and mentorship connections.

Cultural capital: Leadership identity was reinforced by the school’s culture, values, and expectations, shaping how students internalized servant leadership.

Symbolic capital: Participants who demonstrated strong servant leadership values gained recognition and credibility within the school community.

These findings support Golsorkhi et al. (2009), who argue that leadership identities are shaped by institutional fields and structured social environments. Servant leadership does not develop in isolation; rather, it is shaped by institutional norms, cultural expectations, and social capital.

Implications and Recommendations

This study advances the discourse on leadership development by synthesizing Strauss and Corbin’s grounded theory methodology (1990), Taylor’s (2013) leadership development framework, and Bourdieu’s social field theory to provide a deeply contextual, sociologically informed model of servant leadership internalization. The findings extend beyond the context of Hilton College in several meaningful ways:

- **Contribution to Educational Leadership Development**

The framework developed in this study offers a replicable model for other educational institutions seeking to cultivate ethical, reflective, and service-oriented leaders. The emphasis on mentorship, experiential learning, and reflective practice aligns with contemporary pedagogies in leadership education. Schools and universities can adapt the model to their unique contexts to nurture leadership qualities that prioritize empathy, accountability, and collective well-being. Leadership programs in both secondary and tertiary education sectors can use the paradigm to embed servant leadership values in institutional culture, bridging character education with formal leadership development.

- **Influence on Corporate Leadership Training**

The study’s model contributes to the growing interest in servant leadership within corporate settings, particularly in human-centred leadership and ethical business practices. Its emphasis on internalised

values, social conditioning, and mentorship has relevance for leadership pipelines in business, where employee engagement, moral responsibility, and long-term vision are increasingly prioritized. Corporates can use the framework to structure mentorship programs and leadership tracks that emphasize values-based leadership, especially in organizations navigating ethical, social, or generational transitions.

- Application in Nonprofit and Civil Society Sectors

Servant leadership as articulated in this research resonates strongly with the mission-driven ethos of nonprofit organizations. The grounded theory developed here underscores how leadership is not only taught but socially shaped—a key insight for organizations working in community leadership, grassroots activism, or global development. NGOs and social enterprises can use the insights from this study to design youth development programs or community leadership initiatives that prioritize service, empathy, and empowerment from the ground up.

- Theoretical Advancement

The integration of Bourdieu's field, habitus, and capital with grounded theory generates a hybrid lens for analysing how leadership identities are both structured and self-constructed. This sociological re-framing deepens our understanding of how leadership development is embedded in power relations, cultural expectations, and institutional histories. This interdisciplinary approach offers scholars a new methodological and theoretical model for studying identity formation in other social fields—such as medicine, law, politics, or sport—where leadership and service intersect.

Directions for Future Research

Cross-Contextual Validation

Future studies could test the grounded theory model in other elite and non-elite educational settings, both within South Africa and internationally, to explore how context shapes servant leadership development.

Longitudinal Studies

Tracking participants over a longer period could deepen insights into the durability and evolution of servant leadership traits and how they manifest in different life stages and career contexts.

Comparative Sector Studies

Applying this model to corporate, nonprofit, or government leadership programs would help to identify sector-specific adaptations and highlight common sociocultural influences on leadership identity.

Intersectional Perspectives

Further research should explore how race, gender, and socioeconomic status intersect with access to and experience of servant leadership development. This is particularly relevant in post-apartheid South Africa and other stratified societies.

Quantitative Extensions

While grounded theory offers rich qualitative insights, mixed-methods research using validated leadership inventories could test the generalizability and correlational strength of the categories and relationships identified in this study. This broader framing makes clear that the study is not simply about Hilton College—it's about how leadership can be cultivated as an ethical, socially embedded practice across diverse contexts.

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The Impact of Sub-crises on Follower Perceptions of Crisis Leadership Effectiveness

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Keywords

Crisis leadership, follower perception, crisis event, Covid, Conflict

Abstract

This multi-faceted study explores the dynamics of crisis leadership by examining follower perceptions of leadership effectiveness during a primary crisis as well as the impact concurrent sub-crises may have on those perceptions. The research is set against the backdrop of the Covid-19 pandemic, a global crisis that tested leadership across industries. Simultaneously, sub-crises such as racial injustice, voter rights controversies, and political unrest amplified the complexity of leadership challenges in the US. The study was conducted in a Fortune 150 organization, to investigate how these sub-crises influenced follower perceptions of leadership effectiveness. A comprehensive view of crisis leadership was developed, assessing key leadership dimensions such as communication, health and safety, resource availability, consistency, fairness, and employee voice. Data from 334 employees were collected through a survey and analyzed using correlation, regression, and chi-square analyses. The findings demonstrate the significant impact crisis sub-events have on follower perceptions of leadership effectiveness. The results conclude that effective crisis leadership requires not only managing the primary crisis but also navigating the complexities introduced by sub-crises. Leaders who exhibit empathy, adaptability, and consistency in their decision-making are more likely to maintain trust and organizational stability. These findings have implications for developing adaptive crisis leadership frameworks that account for both immediate and cascading challenges.

Introduction

Crisis events in organizations have become more frequent and often play out in very public arenas creating demanding situations and consequences for both private and public organizations and their stakeholders. It has never been more evident as the global Covid 19 pandemic impacted airlines, hospitals, schools, supply chain management, restaurants, sports, and countless other enterprises as well as the millions of stakeholders' dependent upon them. A crisis is unexpected, requires urgent responses, and can threaten organizational values; however, when managed well, a crisis can also bring organizational benefit (Bechler, 1995; Garcia, 2017).

Ineffective leadership and subsequent ineffective crisis management can lead to significant brand damage and, in some cases, significantly threaten the viability of the organization. Effective leadership through a crisis is key to organizational profitability and maintaining employee morale and productivity (Radic, et al., 2020). General Motors and Enron provide past textbook examples demonstrating why effective crisis leadership is not only beneficial but imperative. The actions of a newly minted CEO stemmed the fallout for one while a lack of ethical leadership during a crisis doomed the other.

Leadership has rarely been the focus of crisis management studies. Focus is typically on planning and analysis of contingencies and reactions (Cook & Anderson, 2019). Events such as the September 11, 2001 terrorist attacks, the global financial crisis of 2008 and, most recently, Covid-19 have made crisis events more common place and thus increase the need for crisis leadership (Bhaduri, 2019; Brandebo, 2020; Dalcher, 2020; Varma, 2020). Because leaders are expected to support both the organization and its people through a crisis, theories of people-focused leadership through a crisis are emerging. Leaders able to focus on their people while still managing the crisis event fare better (Collins & Feeney, 2000; Madera & Smith, 2009; Jung, et al., 2009).

Schoenberg (2005) proposed a crisis leadership model of information gathering, external conscience, preparation, and experience, combined with leadership attributes of effective communication,

authenticity, and influence. Powley and Taylor (2014) posited that leaders must possess characteristics that allow them to effectively lead their teams through a crisis event. Leaders should be able to identify signs of crisis, prepare and protect their organization, display efficient and effective decision making, possess an ability to effectively plan, organize, communicate, and coordinate effectively across all stakeholders. Fener and Cevik (2015) suggest leaders must be able to effectively use power and influence, culminating with a successful shift to a “new” normal, all the while learning. Varma (2020) said effective crisis leaders will often reap the benefits of improving their corporate reputation and more importantly, profits and shareholder value. The global Covid pandemic of 2020 and 2021 validated the importance of effective organizational and individual crisis leadership.

As if one crisis weren’t enough to deal with, imagine the difficulties introduced by the presence of multiple crises. It would be naive (and wishful thinking) for leaders to assume they will have to deal with only one crisis at a time. During the same timeframe as the pandemic, several other events (referred herein as “sub-events”) occurred that led to civil unrest. The murder of George Floyd, enactment of voter rights initiatives, attack on the US Capitol, and The Great Resignation all occurred during the 2020-2021 period. This study considers the impact, if any, crisis sub-events have on follower perceptions of crisis leadership effectiveness.

Crisis Defined

Crisis events are, by nature, unpredictable and disruptive. Nassim Nicholas Taleb (2007) referred to them as “black swan events” that are rare, unexpected incidents with severe consequences. Seeger (2002) defined an organizational crisis as “specific, unexpected, and non-routine,” emphasizing its potentially devastating impact and the absence of a clear beginning or end. Organizations across industries have faced numerous crises that tested their leadership and resilience. Notable examples include BP’s Deepwater Horizon explosion in 2010, which resulted in the loss of lives and significant environmental damage, and Boeing’s 737 Max tragedies in 2019, which raised global concerns about corporate governance and safety culture. These events required decisive, ethical, and transparent crisis leadership. Some organizations navigated these moments effectively, while others failed leading to long-term reputational and operational consequences. Given that organizational crises can threaten a company’s very survival, crisis management must be viewed as a strategic imperative (Preble, 1997). Importantly, crises are not always confined to a single, isolated event. As Pinsdorf (2004) noted, organizations often face overlapping and recurring crisis conditions, where the boundaries between onset, escalation, and resolution are blurred. This reality demands ongoing vigilance, adaptability, and leadership grounded in ethical and strategic decision-making.

Crisis Leadership Theory

Crisis management and crisis leadership are different constructs and require different competencies at separate times. In his 2017 book *Crisis Leadership*, Tim Johnson drew on academic research suggesting that crisis management should rely less on flowcharts and checklists and more on creating a crisis-ready culture that enables leaders to make deliberate and wise decisions. Each crisis requires different skills (Powley & Taylor, 2014; Van Wart & Kapucu, 2011). Effective crisis leadership requires the ability to provide stability, empowerment, encouragement, and optimism. It also requires an ability to maintain, allocate, and reallocate resources to manage through and recover from the event, all while ensuring organizational and economic survival (Kaiser, 2020). Research also confirms that leaders must remain composed, calm, and bold (Garcia, 2006). Leader provided stability through a crisis event serves dual purposes of protecting and positively impacting organizational reputation and maintaining/restoring trust of all stakeholders (Fragouli, 2020). Burnison (2020) said “no one thinks about a certain leadership quality-until the you-know-what hits the fan. Effective crisis leaders prepare for the earthquake and the aftershocks, differentiating between urgent and important, leave no one behind, meet people where they are in the crisis, and most importantly, know what to do when you don’t know what to do”.

The term “wicked problem” was first used by Rittel and Webber (1973) to define social policy problems that have no definitive formulation of the wicked problem, are unique, have no defined end nor

immediate and final solution, solutions are not true or false but better or worse, no opportunities to learn by trial and error because every attempt to fix the problem is important, an enumerable set of potential solutions fail to exist and are often symptomatic of other problems, discrepancies representing the problem can be explained multiple ways and the explanation choice determines the nature of resolution, and the social planner can't be wrong. Schiefloe (2020) views the Covid-19 pandemic as a "wicked problem" with considerable ambiguity. Organizations and leaders are often guilty of trying to manage these wicked problems through traditional management skills and practices (Grint, 2005). We sometimes learn the hard way that complex problems require complex solutions. Gilpin and Murphy (2008) suggest that effective crisis leadership goes beyond checklists, protocols, contingency plans, and information distribution. It also requires leader improvisation, flexibility, listening, and an ability to know how to approach and make sense of the wicked problem. Crisis management is a top-down process focused on how to organize when a crisis occurs and how to solve the problem. Crisis leadership requires asking the right questions to better understand the situation from multiple perspectives. A complex crisis requires democratic and collaborative leadership (Muffet-Willet and Kruse, 2009).

Business management is full of complexity and requires leaders to deal with significant pressure and often respond quickly to situations with scarce information (Collins and Jackson, 2015). Emotions can impact leadership (Madera & Smith, 2009). Anger, frustration, and poor leadership behaviors cause disruption (Krasikova, et al., 2013) and can lead to decisions that damage corporate reputations and their brands (Spreier, et al., 2006). Conversely, positive emotions not only positively impact follower performance and follower motivation but also affect the moral quality of leaders. Failure to include ethics as part of the decision-making process can quickly cause reputational damage (Messick & Bazerman, 1996). Four common mistakes made by leaders during a crisis are ignoring the problem, providing misleading information, claiming situations against the reality, and shifting blames to others (Garcia, 2006). All are ethical lapses of leaders that can cause damage to the corporate reputation.

Covid, Conflict, and Crisis

The Covid Pandemic of 2020 became elongated continuing through all of 2021. According to the World Economic Report published by the IMF in April 2021, the global economy contracted by 3.5% in 2020. Yeyati & Filippini (2021) said the impact on world GDP growth was massive, resulting in the largest and deepest global recession since World War II.

Leaders of all organizations, both private and public, were forced to grapple with the perceptions and realities of social injustices throughout the Covid Pandemic. One prominent example was the murder of George Floyd on May 25, 2020, by Minneapolis Police Officer Randy Chauvin. Corporate Executives in many cases were struggling to keep their companies afloat yet were confronted with addressing the issues of racial injustices, not only in Minneapolis but in many cases, their own organizations, and communities in which they lived and served. One-third of Fortune 10000 companies made a public statement on racial equity between May 25, 2020-October 31, 2020. Ninety-three percent made internal or external commitments, and 57% made public commitments of \$66 billion to racial equity initiatives (Fitzhugh, et. al, 2020).

Organizations have also had to confront election reform dividing work forces at the same time they were addressing the Covid 19 crisis. The Brennan Center for Justice published a report dated October 4, 2021, which shared the 2020 federal election drew the highest voter turnout in more than a century. In all but 7 states through September of 2021, 19 states enacted 33 laws some say making it harder for Americans to vote. At the same time, 25 states enacted 62 laws with provisions that expanded voting access. Many argue the restrictive voting laws were passed in Republican states and took aim at minority voters.

Another significant crisis facing leaders was the attack on the US Capitol on January 6, 2021. Business leaders were forced to make choices around their contributions to political leaders and PAC's or other supported organizations that actively engaged in trying to discredit the 2020 Presidential election. Shareholders began to demand accountability for disclosure of company political spending. The Business Roundtable, composed of CEOs of the nation's biggest corporations including Apple, JPMorgan, Chase, GM, and Walmart were quoted in a Time Magazine article dated January 17, 2021 as saying "with our

country in the midst of a pandemic, business leaders recognize that ongoing division and distrust in our political system threatens the economic recovery and job creation our country desperately needs" (Shapiro, 2021). Late in 2021, business leaders began to struggle with the "The Great Resignation". Americans have continued to quit their jobs in record numbers creating staffing shortages in most industries. Kumar (2021) said there were 11 million jobs available exceeding the 8.4 million unemployed. It has forced business leaders to confront a crisis that suggests work and the material well-being it provides many is not all there is. Worker shortages have caused issues across the gamut of industries resulting in some businesses closing their doors permanently, reducing hours, adjusting their business model, and simply competing with other businesses to hire, making recovery infinitely more difficult.

While literature and studies regarding the impact of multiple crises events occurring within the larger Covid pandemic will emerge over time, it is imperative to consider how these events can impact followers' perceptions of effective crisis leadership in their organizations. Klann (2003) said "a crisis can quickly expose a leader's hidden strengths as well as his core weaknesses". The smaller crises events that have occurred throughout the Covid 19 pandemic have required leadership courage. It has been said in many ways "courage is not the absence of fear, but the ability to act in its presence." Courage is a key component of crisis leadership because it demonstrates the leader's willingness to do what's right and act against one's own and other's self-interests to avoid long-term cost (Bazerman & Watkins, 2004). During times of crisis, leaders often find themselves not just managing a single crisis event but other conflicts that might be occurring simultaneously. Heifetz & Linsky (2002) offer those leaders that "get off the dance floor and go to the balcony" fare much better at managing the crisis. Organizational leaders must also be able to assess and reassess the organization's purpose and values to ensure they are not only relevant in the current environment but positioned well for the future. Analysis that allows evaluation of the crisis response, whether the initial crisis or those events happening throughout the course of the initial event, provides an opportunity to realign and/or redefine organizational purpose to make it more relevant to all stakeholders (Klann, 2003). In a recent review of the crisis leadership literature, Chiwisa (2024) concluded "there is no one-size-fits-all strategy to effective leadership, since leaders need to adapt their tactics to fit the individual conditions influenced by internal and external forces", (pg. 48).

Research Question and Hypothesis

The research question guiding this study is as follows:

RQ: Are follower perceptions of crisis leadership significantly changed by internal and/or external sub-events that occur during the main crisis event?

Hypothesis

H₀: Sub-events that occur during the main crisis event lifecycle have no impact on follower perceptions of crisis leadership.

H₁: Sub-events that occur during the main crisis event lifecycle significantly impact follower perceptions of crisis leadership.

Research Methodology

Prior to the conduct of the study, the methodologies to be employed during the study (e.g., sampling, survey design, data collection, data analysis) received approval from the university Institutional Review Board (IRB). Since the focus of the study involves followers' perceptions of the effectiveness of the leadership received, participation was limited to that from direct reports. These direct reports consist of Merit (i.e., salaried) employees below the Managing Director level and all hourly employees within a Fortune 150 company that were employed through the Covid-19 crisis period of March 1, 2020 through December 31, 2021.

Sampling Procedure/Data Collection

Using random email distribution lists, links to a questionnaire on Survey Monkey © were sent to over one thousand potential participants employed by the studied organization between March 1, 2020-December 31, 2021. Postings were also done on several social media websites used by past and present employees. Usable/completed questionnaires were obtained from 334 participants, representing a 33.4%

response rate. A power analysis was done to determine if the obtained sample size was sufficient. Computed using $\alpha=.05$, the sample size of 334 yielded an observed power of .994, confirming an appropriate sample size.

The questionnaire started off by collecting some respondent demographics (gender, race, seniority, and age). Based on research of recognized components of effective crisis leadership, five questions were used to develop a Composite View of overall crisis leadership (see Table 1 below for the specific items). The five components of safety, communication, resource availability, consistency and fairness, and valued opinions were selected based on previous research. Giles (2016) studied 195 leaders in 15 countries across 30 global organizations. Ethics and Safety were rated as the most critical leadership quality. Iordanoglou et al (2014) did similar research in five European countries and identified trustworthiness, interpersonal skills, and motivating others as key crisis leadership skills. Scores on the newly created composite variable could range from 5 (a response of negative or disagree on each of the five questions) to 25 (a response of positive or agree on each of the five questions). The question scores were totaled and a mean composite score for the five questions across all of the respondents was obtained of

Table 1: Survey questions comprising the Composite view of Crisis Leadership effectiveness.

Q#8: Communication from senior leaders to employees was effective throughout the pandemic.
Q#9: Senior leaders put the health, safety, and well-being of employees first throughout the pandemic.
Q#10: My company provided me with appropriate resources to make the best decisions for myself and family through the pandemic.
Q#16: I feel senior leaders partnered with all stakeholders fairly and consistently through the pandemic.
Q#17: My opinions as an employee were valued throughout the pandemic

21.04, an indication of greater than average effectiveness of crisis leadership as perceived by the respondents. More importantly, this indicates that there is still room for the perception of crisis leadership to move in either a positive or negative direction. This is imperative to adequately address the hypothesis.

Five additional questions inquired about changes in perceptions and attitudes of crisis leadership through sub-events that occurred throughout the pandemic, which were subsequently coded and uploaded to SPSS for statistical testing. Table 2 below contains those questions.

Table 2: Survey questions assessing degrees of change in perceptions/attitudes through sub events.

Please indicate the degree to which your perceptions/attitudes changed about senior leadership responses to the pandemic as global social justice issues occurred.
Please indicate the degree to which your perceptions/attitudes changed about senior leadership responses to the pandemic as vaccine mandates were announced.
Please indicate the degree to which your perceptions/attitudes changed about senior leadership responses to the pandemic as our business was significantly impacted by travel restrictions.
Please indicate the degree to which your perceptions/attitudes changed about senior leadership responses to the pandemic during our Presidential election.
Please indicate the degree to which your perceptions/attitudes changed about senior leadership responses to the pandemic as voter rights laws were enacted.

Data Analysis

Analysis of the data in this study used both descriptive and inferential analyses. A correlation analysis was done to analyze relationships between the items making up the Composite View of crisis leadership effectiveness and the sub events that occurred. A regression analysis was done to further analyze which of the variables had more significant impact. Chi-Square Analysis was done to evaluate the relationship between sub-events and demographic variables and finally, a Post Hoc analysis was completed to delve deeper into the found relationships.

Results

Respondent Demographics

Gender composition of the participants was almost evenly split with 177 females (representing 53% of the 334 total respondents) and 157 males (47%). Most of the participants were Caucasian (39%), followed

by African American (30%), Hispanic (18%), and the remaining 13% was comprised of Asian/Pacific Islanders, Multiple Ethnicity, and American Indian/Alaskan Native. The reported age group of the participants was almost evenly split between three periods, each of a decade's length (25 to 34, 35 to 44, and 45 to 54). These made up 23%, 27%, and 26%, respectively, of the respondents. The 55 to 64 years old group comprised 16% of the respondents, while the remaining 8% was evenly split between those at both ends of the scale (18 to 24 and 65 to 74). Seniority levels of the participants were not particularly skewed toward either end of the spectrum with: 18% possessing less than 2 years of experience with the organization, 17% possessing 2-5 years of experience, 30% possessing 6-15 years of experience, 13% possessing 16-25 years of experience, and 22% possessing more than 25 years of experience.

Correlation/Regression Analyses

Correlation analyses were done between questions outlined in Table 1 and questions outlined in Table 2. The correlation analysis revealed significant correlations at the $<.001$ level between the five components of crisis leadership perceptions and the identified sub events occurring through the Covid-19 crisis lifecycle. Results are found in Table 3. As all correlations are statistically significant, these findings provide initial support for the hypothesis.

Table 3: Correlation Analyses of Variables (all are significant at the $<.001$ level)

Variables	Social Justice	Vaccine Mandates	Travel Restrictions	Elections	Voter Rights Laws
Effective Communication	.308	.330	.438	.251	.205
Health/Safety	.399	.394	.421	.218	.207
Available resources	.368	.384	.443	.280	.271
Consistency/Fairness	.333	.363	.419	.229	.282
Valued Opinions	.382	.422	.515	.310	.322

Regression analyses were then done to further examine the significant correlations found in Table 3. For each sub-crisis event, the outcome variable (change in follower attitudes/ perceptions of effective crisis leadership) was regressed against the five predictor variables to assess the strength of the relationships. Table 4 displays the findings.

Table 4: Regression Analyses of Predictors of Change in Perceived Crisis Leadership

Variables	Social Justice	Vaccine Mandates	Travel Restrictions	Elections	Voter Rights Laws
Effective Communication			.046		
Safety/Well-being	.011				
Available resources					.048
Fairness/Consistency	.028	.001**	.006**		.022
Valued Opinions	.005	$<.001$ **	$<.001$ **	.003**	.001**

Significant at $p<.05$ unless denoted by ** indicating $p<.01$

Chi-Square Tests of Independence

Chi Square Analyses were done using demographic variables to examine whether gender, age, race, job classification or seniority could significantly impact follower perceptions of effective crisis leadership as sub events occurred during the main crisis event. Table 5 below illustrates those instances of statistically significant findings.

Table 5: Chi-Square Significant Findings between Sub Events and Demographic Variables

Variables	Gender	Race	Age	Seniority	Hourly/Merit
Global Social Justice					
Vaccine Mandates	.039				
Business Impact					
Presidential Election		.023		.046	
Voter Rights Laws		.023	.020	.006**	.023

Significant at $p<.05$ unless notated by ** significant at $p<.01$

Post Hoc analyses were then conducted on the demographic variables that demonstrated significant Chi-Square relationships. Findings relative to the significant differences found above are captured in Table 6.

Table 6: Post Hoc Analyses of Significant Demographic relationships to sub events

Demographic Variable	Sub Event changes in Perceptions and attitudes	Found Difference
Gender	Vaccine Mandates	Male respondents with “no change” in their opinions was lower than expected and “slightly positive change” was higher than expected.
Race/Ethnicity	Presidential Election	White/Caucasian with a “slightly negative change” was higher than expected. “Overall positive change” was lower than expected
Race/Ethnicity	Voter Rights Laws	White/Caucasian with a “slightly negative change” was higher than expected and “overall positive change” lower than expected.
Age	Voter Rights Laws	-Age group 18-24 experiencing “overall positive change” was higher than expected -Age group 25-34 with an “overall negative change” was lower than expected. -Age group 55-64 experienced “negative change” higher than expected
Seniority	Presidential Election	25 years or more experienced higher than expected “overall higher negative change” than expected.
Seniority	Voter Rights Laws	-25 years or more had higher “overall negative change” than expected. “Negative change” was notable. -Less than 2 years had lower “negative change” than expected. -6-15 years had higher “positive change” than expected but higher “no change” than expected.
Job Classification (Merit/Hourly)	Voter Rights Laws	Hourly employees experienced “slightly negative change” lower than expected and “no change” higher than expected.

Chapter Summary

The results of the quantitative analyses conducted leads to not accepting the null hypothesis, and instead, supports accepting the alternate hypothesis stating sub-events that occur during the main crisis event lifecycle significantly impact follower perceptions of crisis leadership. Further discussion of findings, implications for practice, and opportunities for additional study follow.

Discussion

While the components of effective crisis leadership (communication, care, health/safety, and well-being, available resources, consistency/fairness, and valued opinions of followers) were significantly correlated across the board to perceptions of change across sub-events (social justice issues, the presidential election, business impact because of travel restrictions, voter rights laws, and vaccine mandates), regression analysis was done to further examine if more significant explanatory variables could be discovered. Results of the statistical analysis revealed significance between some, but not all, of the sub-events and Composite view questions outlined in Table 4.

Abelson (1985) conducted a study that calculated the correlation between a Major League Baseball player's outcome in a single at-bat and his overall batting average. The calculation yielded an r of .056. He was a bit surprised by the results but the resolution and overall implications in his study where small effects can matter “in the long run, albeit not very consequentially in a single episode” (p. 133). Abelson's conclusions are an important consideration in this study as, even though none of the effect sizes were strong, statistically significant P-values were nonetheless identified among the variables. Using just the R^2

values to determine the significance of relationships would be remiss and short-sighted if dismissed out of hand. The results indicate partial support of the Research Question. There are indicators that perceptions of effective crisis leadership are impacted by sub-events that happen over the course of a larger crisis event. Moving forward in the discussion, some of these relationships become more meaningful as we delve further into the findings.

Findings have confirmed that sub-events can affect follower perceptions of crisis leadership; however, understanding “where” these effects may lie is equally important when considering both practical and research implications. The “where” required an analysis of the demographic variables of gender, race, age, seniority, and job role (merit or hourly). An overview of significant findings using a Chi-Square Test of Independence is provided in Table 6.

Results confirm that in all but one of the questions, demographic variables impacted perceptions of effective crisis leadership relative to one or more particular variables. Looking a little closer, the variables of race, age, and seniority required additional analysis as more significant explanatory variables impacting follower perceptions of crisis leadership as sub-events unfold. A Post Hoc analysis revealed specifically that white/Caucasians, tenured (25 years plus) and older (55-64), had pronounced negative changes in their opinions of effective crisis leadership as it related to the enactment of voter rights laws and the Presidential Election. In an internal memo, the CEO of the studied organization took a very strong stance on voter rights laws. He called one state’s voting bill “unacceptable”. In the same memo, he said “the right to vote is sacred...it’s evident that the bill includes provisions that will make it harder for many underrepresented voters, particularly Black voters, to exercise their constitutional right to elect their representatives. That is wrong” (Impelli, 2021). Gomez and Doherty (2021) shared a Pew Research Center study that supported the findings relative to race and age. In the study, 48% of White US adults surveyed July 8-18, 2021, said voting is a privilege that comes with responsibilities and can be limited. Only 21% of Blacks shared that opinion. Conversely, 51% of White adults surveyed said voting is a fundamental right for every U.S. citizen and should not be restricted but 77% of Blacks said the same. Older Republican Whites were the least likely to view voting as a fundamental right. Major et al (2018) in their study suggest that race/ethnicity is central to White Americans. Those high in ethnic identification supported Trump’s policies on immigration and his opposition to “political correctness” norms. The findings suggest that it is possible that some sub-events, particularly if they are politically and socially charged, may leave some groups of people feeling disenfranchised and thus with stronger negative perceptions of crisis leadership when leadership views and organizational stances collide with their personal views. Berg (2020), reinforcing why this is important, cited a Gallup poll conducted in the late spring of 2020 finding followers need trust, compassion, stability, and hope the most during a crisis. He posited that during times of crisis, employees look not only for honesty but behavioral predictability.

Leaders must be consistent and compassionate in their messaging, careful to be inclusive of all followers. Vakola (2014) suggested stress can make employees develop and/or harbor negative attitudes towards change, confirming Major et al study (2018) as they posit the changing racial demographics of America have caused Whites to become concerned about declining status and influence, perceived or real. This might suggest context matters when considering changes in perceptions of effective crisis leadership over the course of an elongated event. Certainly, tenured, and older people were concerned about their health and well-being through the Covid crisis and perhaps added in their race with age and seniority, held beliefs inconsistent with senior leaders’ views on specific issues like the Presidential election and Voter Rights Laws. The studied organization for more than 80 years was perceived as purposely conservative, born in the South, and intent on preserving a storied and family-like corporate culture.

The findings and conclusions reached in this study support the research question asked and the hypothesis put forth. Sub-events that occur during a main crisis event can and do impact followers’ perceptions of effective crisis leadership, not always for the betterment.

Conclusion

As stated previously, Garcia (2006) said effective crisis leadership is a competitive advantage. We are reminded that crisis situations threaten organizational reputation, stability, and survival (Fragouli, 2020). This study demonstrated follower perceptions of effective crisis leadership stem from organizational

leadership and their ability to effectively communicate and connect with their teams. Effective crisis leadership demands a leader not only understand their own emotions but equally important is the emotions of their followers. As this study demonstrated, follower perception is not always equal, consistent, or predictable. Wise leaders will recognize a “one size fits all” crisis leadership approach is destined to fail. Our findings provide empirical support for the same conclusion reached by Chiwisa (2024) upon review of the crisis leadership literature.

Dale Carnegie once said, “when dealing with people, remember you are not dealing with creatures of logic, but with creatures of emotion.” His quote goes directly to the components of this study: the importance of follower perceptions of leader care and communication through a crisis event. It has been said many times that people will never care how much you know until they know how much you care.

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Do consumers trust the Bot?

A study of consumer trust in conversational AI Systems

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Brand Communication, Consumer Trust, Conversational AI, Human-AI Interaction, Operational Efficiency, Personalisation

Abstract

Conversational AI systems such as chatbots and virtual assistants have taken customer interaction by storm. Businesses can integrate these customisable chatbots into various customer service channels, including messaging apps, social media platforms, and live chat. From Amazon's chatbot, which replaces the human aspect of customer service, to AI-powered refrigerators that create recipes, these technologies promise efficiency and scalability. However, they raise an important question: Do consumers trust these bots? This review paper critically examines existing academic literature on consumer trust in Conversational AI systems, focusing on how trust is formed, maintained, and sometimes eroded during human-AI interactions.

The study adopts a literature survey approach, drawing from peer-reviewed research across marketing, psychology, and human-computer interaction. It identifies key trust factors such as perceived competence, emotional intelligence, transparency, and personalisation. Despite growing interest in the field, research still has some important gaps. There is a limited understanding of how trust develops over time; little attention is paid to how trust can be repaired after things go wrong, and very few studies look at cultural differences in how people relate to AI. This review stresses the need to design Conversational AI systems that are efficient, trustworthy, human-centred, and ethically responsible.

Introduction

Conversational [artificial intelligence](#) (AI) has been defined and conceptualized as “the study of techniques for creating software agents that can engage in natural conversational interactions with humans” (Khatri et al., 2018).

Conversational AI systems such as chatbots and virtual assistants have taken customer interaction by storm. They have revolutionised how customers interact with brands. The rise of Conversational AI in consumer contexts has transformed how businesses and customers interact. Over the past few years, advancements in natural language processing and machine learning have enabled chatbots, virtual assistants, and other conversational agents to engage with consumers in increasingly sophisticated ways, from Amazon's chatbot, which replaces the human aspect of customer service, to AI-powered refrigerators that create recipes.

Voice-activated assistants like Amazon's Alexa and Google Assistant have allowed consumers to engage with technology hands-free, making shopping more accessible. However, these advancements also bring significant concerns around privacy and trust. Many consumers are wary of sharing personal information with AI systems, raising important questions about data security and the ethical use of AI in marketing and customer service.

Relevance of Trust in Human-AI Interactions

Customer service is seen as a vital aspect of successful business; it directly affects customer retention, brand loyalty, and credibility. Traditionally, direct communication with human agents dominated this service realm, where an agent's presence means personalized intervention and response to customers. However, as AI is advancing at an impressive rate, businesses are steering toward AI-driven chatbots

intended to manage customer inquiries, automate the chatting response process, and generally streamline efficiency.

When consumers trust a brand's AI systems, customer retention becomes easy. Trust influences how consumers engage with technology and make decisions based on AI-driven recommendations and services. In Conversational AI - such as chatbots and virtual assistants - trust directly influences adoption rates, user satisfaction, and long-term acceptance. Trust significantly impacts whether users are willing to adopt and utilise AI systems. Consumers are often less likely to engage with technology they do not trust, which hinders AI's capacity to enhance customer experiences and refine business operations.

Consumers must feel confident that AI systems will securely and ethically handle their information. High trust levels are directly proportional to increased willingness to share data. This shared data can further improve the quality of personalisation and service delivery - a key factor in digital marketing. Startups and businesses have started to increasingly rely on AI tools - such as ChatGPT for content generation or Canva's AI assistant for targeted marketing campaign designs - entrusting them with sensitive business information. This trend reflects operational reliance and growing institutional trust in AI capabilities.

Relevance of Studying Trust in Conversational AI

The rapid integration of Conversational AI into everyday customer experiences highlights the need to study trust in these systems. For instance, Bank of America's Erica - a virtual assistant that leverages natural language processing to deliver personalised financial advice - has handled over 330 million customer requests as of mid-2023, with 60% of user engagements being proactive and personalised. This scale of interaction is only possible because users trust Erica to manage sensitive financial tasks such as bill payments and account tracking (Tyagi, 2024).

KLM Royal Dutch Airlines' BlueBot chatbot, integrated into platforms like WhatsApp and Messenger, assists with booking tickets and checking flight statuses. BlueBot is particularly effective because it builds user trust through clear, consistent communication, seamless handovers to human agents when needed, and the ability to recall prior interactions. This sense of continuity and reliability has allowed KLM to handle double the number of bookings.

Similarly, Lemonade's Maya, an insurance chatbot, has processed over 1.2 million policies in just three years by offering a friendly, empathetic interface that mirrors human advisors. Users trust Maya with product queries and important insurance purchase decisions, making trust a central enabler of adoption (Tyagi, 2024). As Conversational AI takes on increasingly personal roles, from finance to healthcare, understanding and building trust becomes critical for user acceptance and long-term success.

Summary of Gaps in Existing Literature

Although Conversational AI has been widely adopted across industries, existing literature focuses more on functional capabilities - task completion, response speed, and cost efficiency - than on the nuanced factors influencing consumer trust. Emotional aspects like empathy, relational cues, and perceived transparency are often underexplored or treated as secondary considerations. Furthermore, most studies rely on short-term experimental settings or limited case studies, restricting understanding of how trust evolves. There is also minimal attention paid to how cultural, generational, and contextual differences impact trust in AI-driven communication.

Aim and Contribution of the Paper

This paper aims to critically review and synthesise existing academic research on consumer trust in Conversational AI systems. It contributes to the literature by organising findings across interdisciplinary studies - spanning marketing, psychology, and human-computer interaction - and identifying key drivers of trust such as competence, human likeness, ethical data use, and emotional responsiveness. By highlighting gaps in longitudinal, cross-cultural, and real-world chatbot applications, the paper offers a clearer understanding of what makes AI systems trustworthy from a consumer perspective. This review also provides actionable insights for designers, marketers, and researchers aiming to build more ethical and user-centred Conversational AI.

Literature Review

Several studies have explored the evolving role of Conversational AI in shaping user experience, emotional engagement, and trust in consumer-facing technologies. Dobbala and Lingolu (2024) examine how Conversational AI and chatbots enhance user experience across industries by offering accessibility, 24/7 assistance, and personalised responses. However, they also identify critical challenges that impact trust - such as limited contextual understanding, language ambiguity, and ethical concerns surrounding data privacy. The authors argue that for trust to be maintained, conversational agents must integrate emotional intelligence, feedback mechanisms, and secure design features like encryption.

In a regional context, Mustafa (2024) explores how chatbots are used in food delivery apps like Zomato, Talabat, and Deliveroo in the UAE. While users generally appreciated the speed and convenience chatbots offered for handling simple tasks, many were frustrated when the bots failed to understand context, gave irrelevant answers, or could not handle more complex issues. The study highlights that trust in these systems is not just about whether they work - it also depends on how well the chatbot understands the user's intent and adjusts its tone and responses accordingly. This supports the broader view that human-like communication is key to building trust with Conversational AI.

Similarly, Huseynov (2023) looks at how chatbots are used in digital marketing and customer service, showing that they improve user experience and help companies reduce costs. The study points out that the most effective chatbots sound natural, hold a conversation smoothly, and stay true to the brand's voice - making users feel like they are talking to a real person rather than a machine. The paper argues that trust is influenced by how well chatbots can create seamless, personalised experiences that feel coherent with the brand's voice across channels.

Focusing on the emotional dimension of trust, Ltifi (2023) investigates how consumers perceive and respond to chatbots in hedonic and utilitarian contexts. Interestingly, the research notes that chatbot transparency (i.e., when users know they are speaking with a bot) can either increase or decrease trust, depending on how naturally the system communicates.

Adding to this, Manic (2023) explores how conversational AI enhances marketing processes through rapid content creation, targeted email campaigns, and real-time research insights. While emphasizing AI's operational advantages, the study warns that its success relies on maintaining ethical standards and verifying content credibility, thus tying trust to both efficiency and integrity.

Israfilzade and Sadili (2024) examine the role of generative AI and anthropomorphism in conversational marketing. Their framework shows how human-like traits in AI-such as adaptive tone, emotional intelligence, and contextual understanding-can boost user trust, but may also lead to ethical dilemmas if users are not fully aware they are interacting with a machine.

Ramadas and Begam (2023) offer a regional perspective, reviewing customer engagement with AI tools in Chennai, India. They argue that cultural and linguistic differences deeply shape user trust and satisfaction. Their findings reinforce the importance of tailoring AI interactions to local preferences and expectations. Reinhard et al. (2025) conduct a systematic literature review on brand identity in AI-powered conversational design. Their research underlines that AI interfaces that reflect brand values-via tone, design, and interaction style - can foster trust and reinforce customer-brand relationships. They also note the lack of clear frameworks for embedding branding principles in AI design.

Finally, Surikova, Siroda, and Bhattacharai (2022) examine the role of artificial intelligence in shaping brand voice through multimedia platforms. The study introduces the concept of a "brand voice life cycle" and explores how Conversational AI contributes to establishing a brand's personality across channels. The authors highlight that despite growing reliance on AI to drive branding efforts, there is no guideline on how AI should be ethically and effectively integrated into brand communication.

Nicolescu and Tudorache (2022) provide a systematic literature review of human-computer interaction in customer service, highlighting how customer experience with chatbots is shaped by three clusters of factors: chatbot-related (functionality, design, anthropomorphism), customer-related (trust, expectations), and context-related (industry, urgency). Their study reveals that chatbot effectiveness in problem resolution and relevance of responses has a direct impact on continued usage and brand loyalty.

Fionah (2024) investigates AI's role in customer relationship management (CRM), arguing that AI chatbots and virtual assistants significantly enhance customer interaction by offering real-time,

personalized services. The study also addresses the ethical concerns of AI in CRM systems, emphasizing that transparency, privacy, and accountability are essential for consumer trust in AI-based customer service platforms. Lastly, Nicolescu and Tudorache (2022) emphasise that customer satisfaction largely depends on how effectively AI chatbots handle queries and how closely they can mimic human interaction. This is consistent with the view that affective factors like emotional tone, personalisation, and continuity of interaction remain critical in building long-term trust and satisfaction.

S.No.	Author(s)	Year	Key Findings
1	Dobbala & Lingolu	2024	Conversational AI enhances UX through accessibility, 24/7 assistance, and personalization. Trust challenges include limited contextual understanding, language ambiguity, and data privacy. Trust is maintained by integrating emotional intelligence, feedback mechanisms, and secure design.
2	Mustafa	2024	(UAE context) Chatbots in food delivery apps offer speed and convenience for simple tasks. Frustration arises from context misunderstanding, irrelevant answers, and inability to handle complex issues. Trust depends on intent understanding and adaptable tone/responses, supporting the view that human-like communication is key.
3	Huseynov	2023	Chatbots in digital marketing and customer service improve UX and reduce costs. Effective chatbots sound natural, converse smoothly, and maintain brand voice.
4	Ltifi	2023	Empathy, friendliness, and emotional relatability significantly influence trust in chatbot interactions. Transparency can either increase or decrease trust depending on natural communication.
5	Manic	2023	Conversational AI enhances marketing through rapid content creation, targeted campaigns, and real-time insights. Success relies on maintaining ethical standards and verifying content credibility, linking trust to efficiency and integrity.
6	Israfilzade & Sadili	2024	Human-like traits (adaptive tone, emotional intelligence, contextual understanding) in generative AI can boost user trust in conversational marketing. However, this may lead to ethical dilemmas if users are unaware they are interacting with an AI.
7	Ramadas & Begam	2023	(Chennai, India context) Cultural and linguistic differences deeply shape user trust and satisfaction with AI tools. Tailoring AI interactions to local preferences and expectations is crucial.
8	Reinhard et al.	2025	AI interfaces reflecting brand values (tone, design, interaction style) foster trust and reinforce customer-brand relationships. There is a lack of clear frameworks for embedding branding principles in AI design.
9	Surikova, Siroda, & Bhattarai	2022	AI shapes brand voice across multimedia platforms, contributing to brand personality ("brand voice life cycle"). A structured academic framework for ethical and effective AI integration in brand communication is needed.
10	Nicolescu & Tudorache	2022	Customer experience with chatbots is shaped by chatbot-related (functionality, design, anthropomorphism), customer-related (trust, expectations), and context-related (industry, urgency) factors. Chatbot effectiveness in problem resolution and response relevance directly impacts continued usage and brand loyalty.
11	Fionah	2024	AI chatbots and virtual assistants enhance customer interaction in CRM by offering real-time, personalized services. Transparency, privacy, and accountability are essential for consumer trust in AI-based customer service platforms.
12	Nicolescu & Tudorache	2022	Customer satisfaction hinges on AI chatbots' query resolution and human-like engagement. Affective factors like emotional tone, personalization, and continuity of interaction are critical for long-term trust and satisfaction.

TABLE 1: Summary of Key Findings from Reviewed Literature on Consumer Trust in Conversational AI Systems

Research Methodology

This study adopts a structured literature review approach to investigate the formation and dynamics of consumer trust in Conversational AI systems. A comprehensive search was conducted across multiple

academic databases, including Springer, Research Gate, to identify peer-reviewed articles published between 2018 and 2025. The keywords used for retrieval included combinations of “Conversational AI,” “consumer trust,” “branding,” and “user engagement.”

Discussions and Conclusions

This review paper examined how trust is formed, sustained, and sometimes eroded in consumer interactions with Conversational AI systems, such as chatbots and virtual assistants. Drawing from interdisciplinary literature, the review identified several key factors that influence trust, including perceived competence, transparency, emotional responsiveness, and the ability of AI to replicate human-like interactions.

While Conversational AI has enhanced customer experience and operational efficiency, the findings suggest that functionality alone is insufficient - trust remains a critical enabler of adoption and long-term engagement. Emotional and relational dimensions, such as empathy and personalization, are crucial to user satisfaction but often underexplored. Furthermore, existing literature rarely investigates trust repair after failures or explores how trust evolves across repeated interactions in real-world settings.

The importance of understanding cultural and demographic diversity in trust perception also emerged as a key theme. Many systems are designed for Western audiences, with little attention to cross-cultural nuances or digital literacy levels. Overall, trust in Conversational AI is not merely a technical issue but a complex, ongoing relationship shaped by human psychology, cultural expectations, and ethical considerations.

Limitations and Direction for Future Research

While recent studies highlight the growing role of Conversational AI in enhancing customer experience, efficiency, and brand communication, several critical gaps remain in the current literature. Many existing works focus heavily on technical performance and functionality, such as the ability to resolve basic queries or simulate human dialogue (Mustafa, 2024; Huseynov, 2023), but give limited attention to how trust is built and maintained over time, particularly in emotionally sensitive or complex customer interactions.

There is also a noticeable underrepresentation of emotional and relational dimensions of chatbot trust. Although Ltifi (2023) explores empathy and emotional engagement as trust drivers, such studies are still relatively rare. Most papers assess user satisfaction or usability without fully exploring the psychological processes behind how trust is formed or eroded in human-AI interactions. Moreover, there is a lack of longitudinal and real-world deployment studies. Much of the existing research is based on one-time surveys or isolated case studies (e.g., Mustafa, 2024), which limits our understanding of long-term trust dynamics, especially for business sectors like banking, healthcare, or insurance.

Lastly, there is minimal cross-cultural research, with most studies focused on Western or single-region contexts. Broader, comparative research is needed to understand how trust in Conversational AI varies across demographics, cultures, and digital literacy levels. These gaps underscore the need for more interdisciplinary, long-term, and user-centred research that measures technical success and examines how trust is earned, sustained, and repaired in Conversational AI systems.

To address these gaps, future research should prioritise longitudinal studies that track trust over repeated interactions and cross-cultural investigations to understand diverse consumer expectations. Developers and businesses should focus on designing Conversational AI systems that are efficient, empathetic, transparent, and adaptable. Ethical guidelines for AI use - mainly in data handling, bot disclosure, and decision-making transparency - are essential to build and maintain trust at scale. By placing trust at the centre of AI design and deployment, organisations can unlock the full potential of conversational technologies in consumer engagement.

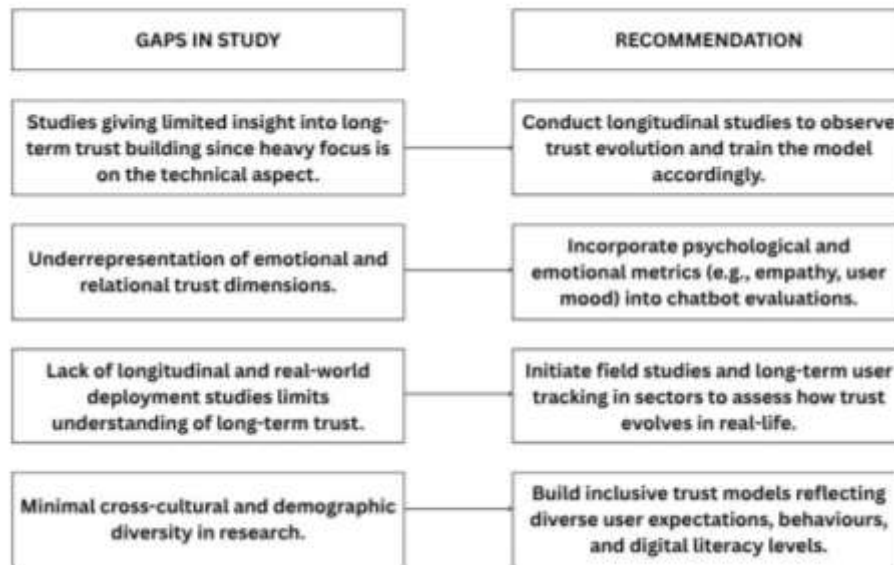


FIGURE 1: Summary of Research Gaps Identified in the Literature and Corresponding Recommendations for Future Research Directions

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Institutional Theory & Corporate Social Responsibility: A comparative case study on ESG integration, Ethical disclosure and ESG Risk of Unilever and Boohoo

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Keywords

Corporate Social Responsibility (CSR), Institutional Theory, Corporate Governance, Environmental, Social and Governance (ESG), Symbolic Vs Substantive CSR, Ethical Business Practices, Corporate Financial Performance, Stakeholder Trust.

Abstract

Amid the growing demand for transparency in corporate reporting globally, companies started using Corporate Social Responsibility as a strategic mechanism for fostering stakeholder trust and achieving long-term sustainability. This study adopts a comparative case study approach to critically examine how companies are leveraging their CSR narratives to win trust and secure institutional investment. Focusing on Unilever and Boohoo, the research examines the CSR integration and its authenticity with the company's actual practices. A genuine alignment of CSR with operational conduct exemplifies the creation of social value. Whereas questions posed on the credibility of a company's ethical claims, public commitments, and social responsibility act as a destroyer of the company's value. Drawing on Institutional Theory, the research applies normative, coercive, and mimetic pressures to assess the influence of institutional expectations on corporate behaviour. The study employs qualitative methods, analysing secondary data, to explore the relationship between CSR communication, Corporate Governance policies, and actual practices. The study offers critical insights into a transparent integration of CSR into a company's strategy and operational practices for investors, scholars and regulators interested in CSR accountability. The study followed a case study approach which revealed that Unilever demonstrated substantive CSR engagement whereas Boohoo exhibits symbolic CSR practices. This resulted in higher ESG score and lower ESG risk metrics of Unilever with a positive correlation between their CSR practices and improved corporate financial performance. In Boohoo, despite their policies and efforts to improve ESG rankings, the financial performance has declined over the period of last five years demonstrating the nature of their CSR practices and lack of alignment of the same with operational practices and corporate strategy. The research contributes to the discourse on institutional legitimacy and CSR authenticity offering critical insights for corporations, investors, regulators, and academics interested in transparent CSR practices and integration of the same into corporate strategy and governance.

Introduction

Corporate Social Responsibility (CSR) remains one of the most discussed and contested evolving topics in corporate world. According to Okoye, (2009), there is no universally accepted definition of CSR although it is widely agreed as a broad phenomenon that reviews environmental suitability, legal compliance, and workforce rights related to human welfare for internal and external stakeholders (Blowfield and Dolan, 2008). CSR has evolved over the years and has become an essential element of modern business strategy, encompassing distinct themes, domains, and geographic locations globally (Waheed and Yang, 2019). There has been a growing demand for transparency in financial reporting and decision-making among stakeholders and therefore the notion of organisations making positive contributions to society has gained considerable impact over the past few decades (Lee, 2008). Society nowadays expects organisations to go beyond profit-making and act responsibly towards the environment, economy, and society. For example, stakeholders' expectations include being socially engaged with authentic contributions and not just "greenwashing" (Delmas and Burbano, 2011), ethical

supply chains rather than unethical labour practices, and consumers' informed choices rather than mistrust and deception leading to the distortion (New, 2021). Stakeholder expectations have become a global challenge in the realm of corporate governance and financial reporting, and organisations are facing regulatory pressures. Also, stakeholder demand is increasing towards greater accountability and transparency with CSR disclosures forming heart of non-financial reporting (Ginige et al., 2018). In the UK, there are growing concerns about institutional environments regarding sustainability, labour practices, and social impact stemming from both individual actions and institutional behaviours.

Embedding Corporate Social Responsibility helps companies build a positive corporate image for businesses that operate within a framework that creates sustainability of operations and supports achieving long-term success. Therefore, every organisation is in some way, or another involved in CSR activities to win both internal and external stakeholder trust (Skudiene and Auruskeviciene, 2012). Institutional legitimacy and ethical behaviour are interlinked, steering the need for rigorous professional scrutiny within the field of accounting. Institutional theory provides a framework that highlights the external expectations and the adapted structures, policies, and practices which is adopted by organisations in response to external expectations. The institutional theory framework provides a valuable lens to understand the influence of social, cultural, and regulatory expectations around CSR disclosure and ethical accountability for organisations (Scapens and Varoutsas, 2010). The theory argues that organisations do not operate by free will but instead are subject to institutional forces that push them towards adopting these structures, norms, and behaviours (DiMaggio and Powell, 1983). According to the institutional theory, organisations often adopt CSR into their core business strategy to meet external expectations to gain legitimacy, mitigate risk, and align with expectations of regulators, stakeholders, investors, and society rather than a genuine commitment towards ethical conviction (Marquis, et al., 2017). While some organisations genuinely embed an ethical culture and integrate these principles within their operations, others may only engage in 'decoupling' practices, where policies may only exist to window dress with little impact on their business operations (Ginige et al., 2018).

This study aims to critically evaluate the environmental, social and governance (ESG) principles and practices disclosed and operationalised in two UK consumer companies, Unilever PLC and Boohoo Group PLC. The extent to which these practices are integrated into the operations and strategy defines the nature of their CSR practices such as symbolic and substantive ESG practices. Grounded in institutional theory, this paper investigates motivations behind CSR disclosures and evaluates the extent to which Boohoo and Unilever align their practices to non-financial reporting. The analysis contributes to the broader disclosures on CSR authenticity, institutional legitimacy and the role of embedding ESG in shaping corporate brand identity.

Research Questions:

To achieve the primary research aim, the following Research Questions have been developed.

1. *How do Unilever and Boohoo align their CSR policies with operational practices, and what does this reveal about their authentic CSR engagement?*
2. *What is the relationship between symbolic versus substantive CSR practices and ESG performance outcomes in Unilever and Boohoo as interpreted through Institutional Theory?*
3. *What is the relationship between ESG ranking and Corporate Financial Performance in Boohoo and Unilever, and how does this reflect integration of CSR practices in their business model?*
4. *To what extent do discrepancies between CSR communication and corporate governance practices influence stakeholders trust and investor behaviour?*

Literature Review

Institutional influences on CSR policies and practices have been widely examined in scholarly discourse. Campbell (2007) provides empirical evidence for institutional theory and argued that an institutional framework can lead to a strong socially responsible corporate behaviour. Bansal (2005), through a longitudinal study on Canadian firms highlighted that organisations engage in CSR for ethical and regulatory reasons in early stages, but resource-based capabilities drive their CSR practices to institutional adaption over time. Margolis and Walsh (2003) conducted a meta-analysis of 100 empirical studies to explore the relation between corporate social performance (CSP) and corporate financial

performance (CFP). While acknowledging the primary focus on the profitability as a prerequisite for CSR, they argued that corporates bear a broader social responsibility and address human needs beyond financial imperatives. Maignan and Ralston (2002) highlighted the impact of national and cultural contexts on CSR practices with a comparative analysis of US and European firms. Their study revealed that U.S firms predominantly emphasize legal, regulatory and economic responsibilities whereas European firms are more inclined towards Stakeholder-oriented approaches. They called for greater attention to institutional mechanisms suggesting that corporations are required to adapt CSR practices to meet legitimate demands of stakeholders particularly regulators. Marquis et al. (2017) further reinforced this view by emphasizing the strategic integration of stakeholders and institutional pressures with corporate behaviour and reporting practices. On the one hand, Waddock and Graves (1997), through a regression analysis, found that an increase in corporate financial performance was positively associated with an increase in corporate social responsibility. Whereas McWilliams and Siegel (2000) argue that CSR is an investment and found no positive or negative significance between firm-specific characteristics. Organisations tend to adopt structures and practices to gain legitimacy within their social, cultural, and regulatory environments (Scott, 2014). Although processes and mechanisms that influence the CSR behaviours of organisations have been studied over time, little is known about the effectiveness of CSR practices (Yin, 2017) and its impact on corporate financial performance (McWilliams and Siegel, 2000).

Institutional theory

Institutional theory offers invaluable insights into how organisations become institutionalised (Aronson and LaFont, 2022) and three key mechanisms coercive, normative and mimetic pressures influence organisations to align their financial and non-financial reporting practices with stakeholder expectations (Dimaggio and Powell, 1983). Coercive pressures arise from legal and regulatory requirements, government policies that compel organisations to comply with certain standards such as compliance with Modern Slavery Act etc. Normative pressures are driven by industry standards and societal expectations. These encourage organisations to go beyond compliance and align their practices with ethically appropriate CSR initiatives that reflect in sustainability, social justice and equity (Schons and Steinmeier, 2016). The third set of pressures known as mimetic pressures emerge in times of uncertainty, where organisations imitate practices of perceived leaders or industry benchmarks to gain legitimacy and continue to be competitive in markets. This form of institutional isomorphism leads firms to replicate CSR strategies that are seen as successful or reputable within their industry, even if the adoption is more symbolic than substantive (David et al., 2019). Together, these institutional forces shape how organisations conceptualise and implement CSR, influencing whether their engagement is authentic or strategically motivated to secure legitimacy (Scott, 2008). Systematic reviews over time have found that organisational regulatory or stakeholder demands tend to improve reportage, but such enrichments are not always accompanied by ethical practices (Unerman and Bennett, 2004).

According to Gray et al., (1995) accounting plays a critical role in CSR disclosure, enabling standardisation, comparability, and accountability. The development of integrated reporting frameworks, such as the Global Reporting Initiative (GRI), allows stakeholders to understand how the organisation is meeting social and environmental responsibilities. There is the International Integrated Reporting Council (IIRC), which promotes a framework going beyond financial and non-financial metrics (Eccles and Krzus, 2014). Conversely, Rinaldi et al., (2018) argue that these frameworks may facilitate impression management if not braced by independent assurance and rigorous internal processes, then it can lead to the discovery of a gap between the organisational impression and its true reality (Simnett and Huggins, 2015). Integrated reporting has often emphasised the stakeholder dialogue and materiality, yet critics have argued that CSR disclosures generally overemphasise positive impacts while moderating other factors such as risks and grievances (Michelon et al., 2015).

Symbolic vs Substantive CSR Initiatives

Existing literature exhibits a distinguishing theme between symbolic and substantive Corporate Social Responsibility practices (Schons and Steinmeier, 2016). Symbolic CSR involves superficial and performative activities that are often limited to reporting whereas substantive CSR reveals the real

changes in an organisation's processes and its outcomes. Marquis et al., (2007), extend institutional theory by arguing that these policies are also shaped by local community-level pressures in order to gain legitimacy. It is stated that symbolic practices are often seen as satisfying external stakeholder expectations by performing highly visible actions whilst having a lower impact, in contrast, substantive practices embed ethical values within decision-making within their organisational culture (Schuman, 1995). Porter and Kramer (2006) introduced the concept of "Creating Shared Value" where companies enhance competitiveness and advance social and economic conditions in the communities in which they operate. Empirical studies have highlighted that leading multinational organisations, especially those with a history of sustainability, tend to demonstrate more substantive CSR, likely due to stronger internal governance and stakeholder integration. Eccles et al., (2014) contribute to the literature by providing strong empirical evidence through a study on 90 US firms over an 18-year period, concluding that high sustainability firms outperformed low sustainability firms in stock market and resulted in higher organisational performance.

CSR regulation has evolved through a combination of mandatory requirements, one being the institutional investors' codes, where environmental, social, and governance (ESG) factors are integrated to not only evaluate an organisation's financial performance but environmental impact too. Professional accountancy bodies are advocating ethical accounting within their ongoing training (Gray, 2010). Clarkson et al., (2008) state that UK firms often engage in greenwashing or selective disclosure, which is evident through scholarly research. This indicates a structural misalignment, where demands push for transparency, and where many organisations practice symbolic compliance rather than substantive change. Thus, Humphrey et al., (2017) found that the UK institutional context demonstrates how coercive and normative forces prompt reporting, but not necessarily ethical practice. Cross-case reviews suggest that institutional legitimacy is more stable and credible when CSR is embedded in organizational logic rather than deployed at moments of public pressure (Deephouse et al., 2017; Marquis et al., 2007). CSR accounting under institutional theory thus depends not only on external expectation and regulation but on internal commitment and capability (Dillard et al., 2004).

Research Gap

Despite the growing body of research on CSR and ESG, several critical gaps remain such as lack of longitudinal studies that compare and contrast symbolic vs substantive CSR interventions (Bebbington & Unerman, 2018). This limits our understanding of how CSR evolves over time and how symbolic gestures transform into substantive commitments. (Michelon et al., 2015). Second, there is a need for more empirical assessment of assurance practices in relation to credibility of CSR disclosures. While third-party audits and sustainability certifications are increasingly becoming popular, their actual impact on stakeholders trust remains underexplored. Finally, there is limited research across cultural contexts and specific industries which constrains generalisation of CSR findings and disclosures. Studies such as Maignan and Ralston (2002) highlighted national and cultural differences in CSR emphasis and a cross-sectional analysis is needed to understand how these shape CSR authenticity and organizational legitimacy.

Methodology

The current study employs a comparative case study approach to critically examine the strategic integration of Corporate Social Responsibility in the operational practices of two UK based companies: Unilever and Boohoo. The case study approach is well suited for this research as it enables context-rich exploration of how Sustainability and governance practices are shaped by institutional pressures within specific organisations allowing a nuanced in-depth understanding of CSR strategies and comparison of practices between companies like Unilever and Boohoo. (Fatima and Elbanna, 2022) The research is grounded in Institutional Theory which provides a strong conceptual framework for analysing how organisations respond to external pressures in shaping their CSR practices, disclosures and operations. (Scott, 2021; Brammer et al., 2022). The rationale for choosing Unilever and Boohoo for this case study is the contrast in reputational and operational profiles of these two companies as Unilever is widely recognised for its long-standing commitment to ethical leadership, governance and sustainability

evidenced by its Sustainable Living Plan (SLP) and embedding ESG metrics into its corporate strategy, operational practices and performance indicators. Whereas Boohoo, by contrast, has faced material criticism, legal and regulatory scrutiny over their labour practices, supply chain transparency particularly during Leicester garment factory scandal (BBC, 2020). The contrast between the profile of these two companies enables a critical exploration of how institutional pressures influence CSR policies and practices and whether these narratives align with actual operational conduct of companies.

The data collection is primarily based on published secondary sources, including annual reports, sustainability disclosures, regulatory findings, media coverage and investigations. This approach is highly effective given the focus on publicly communicated CSR strategies of these companies and institutional signalling integrated within these CSR strategies (Silva et al., 2020). A study of longitudinal perspectives that identifies the shifts in CSR disclosures and institutional responses over a period of time is possible using secondary data. An analytical framework is structured around thematic analysis of the secondary data of these two companies guided by three pillars of institutional theory namely normative pressures, societal expectations and coercive pressures. In the study, normative pressures have been examined through the alignment of CSR disclosures with the expectations of key stakeholders such as commitments to sustainability, climate actions, diversity, ethical sourcing etc. Coercive pressures are measured through compliance with legal requirements, regulatory frameworks, key enactments such as Modern Slavery Act and Corporate Governance Code by the Financial Reporting Council (FRC). Mimetic pressures are identified in the implementation and adaptation of CSR practices across the industry participants driven by benchmarking and reputational concerns (Oware et al., 2022). The study employs triangulation of cross-referencing corporate disclosures with media reports, third party evaluations and academic commentary for enhancing the validity and credibility of findings. This approach mitigates the risk of bias inherent in CSR data reported by the corporates and allows critical assessment of the authenticity of ethical and sustainability claims (Wijen, 2021). For instance, Boohoo's ethical claims have been analysed along with investigative journalism to assess the extent of substantive change versus symbolic compliance.

For the current research, we used the ESG database of London Stock Exchange Group (LSEG) which is widely used in research. The database is rich due to its breadth and depth of covering 90% of market capitalisation of corporations globally with more than 870 internal metrics (LSEG, 2025). ESG score is weighted average of three scores individually calculated as Environmental pillar, Social pillar and Governance Pillar. Under Environmental three items or categories have been used, Resource use, Emissions and innovation. Social pillar comprises workforce, human rights, community and product responsibility whereas Governance pillar is made of Management, Shareholders and Corporate Social Responsibility (CSR) strategy. ESG score is further extended to include ESG controversies across all ten categories aggregated in one category score. This makes ESG score into ESGC score including controversies which provides a comprehensive scoring of a company's ESG performance from ESG pillars which is discounted based on the negative media stories. When companies are involved in one or more ESG controversies falling in any of the above ten items falling in Environmental, Social and Governance pillars, the ESGC score is calculated as the weighted average of ESG and ESG controversies reported in the fiscal period. In case of those companies not involved in any ESG controversies, the ESGC score is equal to its ESG Score. From the point of view of key principles, ESG scoring methodology is designed to enhance materiality, transparency and credibility. LSEG's ESG database is the largest database in the world with over 600 content research analysts trained to collect ESG data with local language expertise and operating across the world. The data is collected from various published sources highly reliable including Stock Exchange Filings, company's annual reports, company's websites, NGOs and third-party websites, and international news sources.

Ethical considerations are central to the research design. Although, the study does not involve human participants as no primary data is collected, it adheres to the principles of academic integrity, critical reflection, and transparency. The aim is not to indict specific companies, but to provide a balanced approach with evidence-based evaluation of how institutional dynamics shape CSR practices in the context of UK Corporates.

Analysis

For evaluating the effectiveness of CSR practices of both the companies and studying the correlation between the ESG scores with the financial performance, we have considered 5 years data from 2020 to 2024. The data relating to revenue, net income, EPS and ESG score of both companies has been extracted from Eikon Refinitiv with an institutional licence.

Year	Boohoo				Unilever			
	Revenue	Net Income	EPS	ESG Score	Revenue	Net Income	EPS	ESG Score
2024	1,461.0	(137.8)	(0.11)	C	60,761	5,744	2.30	C+
2023	1,768.7	(75.6)	(0.06)	B-	59,604	6,487	2.58	B-
2022	1,982.8	(4.0)	0.00	C	60,073	7,642	3.00	C+
2021	1,745.3	90.7	0.07	C-	52,444	6,049	2.33	B+
2020	1,234.9	63.7	0.05	C-	50,724	5,581	2.13	C+

Table 1: Revenue, Net Income, EPS and ESG score of Boohoo and Unilever for 5 year period from 2020 to 2024

It is evident that Unilever follows a substantive CSR practice with institutional legitimacy whereas Boohoo has symbolic CSR practices resulting in organisational fragility. Unilever's ESG policies and commitments are deeply embedded in its operational and strategic policies that coincide with robust financial performance. From an institutional theory perspective, Unilever appears to adapt normative and cognitive institutional pressures aligning its practices with industry norms and stakeholders' expectations. This enhances the organisational legitimacy, builds investor confidence, transparency and trust. The convergence of ESG performance suggests that the company's CSR initiatives are not just reputational tools but are substantively embedded into the value creation process that reinforces institutional credibility. In contrast, Boohoo's financial performance reflects the patterns of its ESG score as the CSR practices serve as a façade to defend external scrutiny but not to drive internal transformations. Over the period, the ESG score is consistently low that coincides with sharp financial decline year to year. Although the ESG score shows improvements in the year 2023, the revenue witnessed a sharp decline from £1.98 billion in 2022 to £1.46 billion in 2024 with a reversal of net income into a net loss of £137.8 million. In terms of the institutional theory, this is a case of decoupling where CSR policies are adopted to gain legitimacy and handle pressures superficially without corresponding application into the practice. Boohoo's inability to embed ESG principles and CSR practices with its operations undermined its legitimacy which resulted in deteriorating financial performance due to superficial compliance and failing stakeholders' expectations.

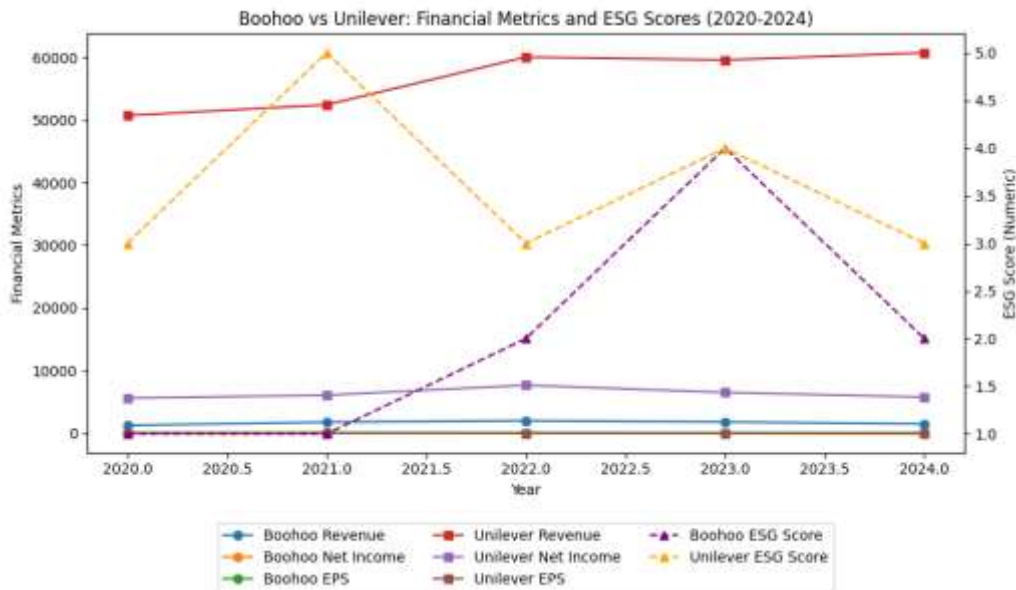


Figure 4: A comparison of Financial Metrics, ESG scores of Boohoo and Unilever

From the data obtained from Sustainalytics, a comprehensive ESG risk rating scores of Unilever and Boohoo is made to compare the risk profiles that reflect divergent levels of sustainability integration into operations and the corresponding reputational exposure of the company. Unilever with a clear A- ESG score has achieved high ratings in all the three pillars that resulted in low ESG risk posture. The company is able to demonstrate a very low ESG rating risk with a 19.6 score making it one of the best performers in the decile of household products industry. The primary reason attributed to the success of Unilever in terms of highest ESG scoring and low ESG risk rating are its substantive CSR practices making it 9th safest company to invest out of 104 companies in the industry. In contrast, Boohoo exhibits a significantly higher ESG risk with a rating of 35.1 placing the company as the worst performer in the industry standing last among 450 players within its industry. The score symbolises the history of ESG controversies, the pattern of symbolic CSR practices with sustainability efforts performative rather than transformative. The disparity in ESG risk between the two firms underscores the importance of authentic, embedded ESG strategies in mitigating reputational and operational vulnerabilities in contemporary corporate governance.

BOOHOO GROUP PLC (DEBS.L)					
	2023	2022	2021	2020	2019
ESG Report Auditor Name	--	--	--	--	--
ESG Combined Score	C	B-	C	C-	C-
ESG Score (Weight 100.0%)	C+	B-	C+	C-	C-
Environmental Pillar Score (Weight 19.1%)	A-	A-	B+	B-	C
Social Pillar Score (Weight 42.6%)	D+	C-	C-	C-	C-
Governance Pillar Score (Weight 38.3%)	B-	B	C	D+	C
ESG Controversies Score	C	B+	C-	A+	A
UNILEVER PLC (UL)					
	2024	2023	2022	2021	2020
ESG Report Auditor Name	KPMG LLP	PWC LLP, UK	PWC LLP, UK	PWC LLP, UK	PWC LLP, UK

ESG Combined Score	C+	B-	C+	B+	C+
ESG Score (Weight 100.0%)	A-	A	A	A	A
Environmental Pillar Score (Weight 25.4%)	A	A-	A	A	A-
Social Pillar Score (Weight 49.3%)	A-	A	A	A+	A+
Governance Pillar Score (Weight 25.4%)	A-	A	A+	A	A
ESG Controversies Score	D-	D+	D-	C+	D

Table 2: ESG rating of Boohoo and Unilever

ESGC scores provide a rounded and comprehensive scoring of a company's ESG performance, based on the reported information pertaining to the ESG pillars, with the ESG controversies overlay captured from global media sources. The main objective of this score is to discount the ESG performance score based on negative media stories. It does this by incorporating the impact of significant, material ESG controversies in the overall ESGC score. When companies are involved in ESG controversies, the ESGC score is calculated as the weighted average of the ESG scores and ESG controversies score per fiscal period, with recent controversies reflected in the latest completed period. When companies are not involved in ESG controversies, the ESGC score is equal to the ESG score.

LSEG's ESG scoring methodology rests on five key calculation principles designed to enhance materiality, transparency and credibility. First, unique materiality weightings (1–10 scale) align each metric's importance with industry-specific sustainability risks and opportunities, following frameworks such as the SASB Materiality Map (SASB Foundation, 2018). Second, transparency stimulation ensures that non-disclosure of highly material data materially penalises a company's score, incentivising complete and accurate reporting (Global Reporting Initiative, 2016). Third, an ESG controversies overlay applies severity weights—adjusted for market capitalisation—to magnify the impact of significant negative events on the overall score, thereby counteracting the bias that large firms often enjoy in aggregate ratings (Chatterji and Toffel, 2016). Fourth, data-point benchmarks at the industry and country levels facilitate peer comparison, supporting rigorous relative analysis (Kotsantonis, Pinney and Serafeim, 2016). Finally, a straightforward percentile-rank methodology eliminates hidden calculation layers, producing scores that are both transparent and easily interpretable by stakeholders (Clark, Feiner and Viehs, 2015).

Conclusion

The study critically examined the Corporate Social Responsibility practices, ESG ratings and risks of Boohoo Plc and Unilever Plc through the lens of Institutional Theory. It is identified with evidence that Unilever has been benefitted with its CSR practices creating institutional legitimacy whereas Boohoo's symbolic CSR practices have resulted in organisational inability to withstand and recover from its failure. There is a positive correlation between CSR and operational practices and integrating CSR into strategy and operations enhance stakeholder confidence, transparency and trust. This is in line with the literature that stated that substantive CSR practices have a positive impact on the institutional performance and corporate image (Eccles et al., 2014). It is concluded that firms with high sustainability and better ESG integration have outperformed firms with low sustainability. It is crucial to understand how these organisations respond to the institutional pressures and share their environmental, social and governance requirements to build their corporate identity and gain legitimacy. By embedding long-term value-driven sustainability initiatives, Unilever demonstrated a strategic and integrated approach with proactive CSR strategies aligned with normative pressures. The company has adopted an agenda that is aligned with stakeholder expectations to create stakeholders trust and confidence. In contrast, Boohoo involved in multiple controversies subjected to external and media criticism with regulatory actions and scrutiny. This shows a symbolic compliance rather than a transformative and substantive change.

The research adopts a case study approach to examine the key characteristics of Institutional Theory that underpin the adoption of ESG policies of the two UK based retail companies to assess why, how and to what extent embedding these benefit the organisation to gain a constructed legitimacy. The theory

reveals that CSR is not a moral compass to handle external pressures but sincerity of an organisation towards its CSR initiatives has a direct and latent impact on corporate financial performance and stakeholder confidence of an organisation. While both the firms under consideration in the study operate in similar institutional environments, there is a huge difference in strategic alignment and integration of CSR activities with core institutional practices.

Recommendations

To enhance the effectiveness of CSR strategies, both Boohoo and Unilever must adopt differentiated approaches to align their initiatives with institutional expectations and stakeholder demands. For Boohoo, a strategic shift from reactive to a proactive CSR approach is imperative which involves embedding sustainability into its core operations, governance frameworks, supply chain, labour practices. Transcending beyond compliance, Boohoo must internalise stakeholder value by creating an organisational culture that is ethical, transparent which promotes integrity and accountability. Establishing robust governance and reporting structures is essential to meet societal expectations and rebuild stakeholder trust. Although Unilever is very well-positioned to lead the industry standards by using institutional pressures, it can further strengthen its position as a CSR leader by collaborating with regulatory bodies and civil society to shape sustainable markets. Unilever should leverage its leadership and promote higher CSR standards across the sector to shape industry norms.

Both Unilever and Boohoo should continue to improve governance models and real-time ESG disclosures, which would reinforce institutional legitimacy and public trust. Essentially, both companies should adopt a clear, consistent, and independently verified reporting on environmental and social impacts. Both companies should implement rigorous audit systems with inclusive oversight mechanisms to boost accountability and trust.

Limitations

For companies like Unilever, having operations spread globally, it is possible to match CSR practices to local or regional contexts. As legitimacy is not universal, what is accepted in one region may not be accepted or perceived to be valuable in another. Localised strategies can help firms navigate diverse regulatory landscapes and meet stakeholder expectations effectively.

Future research should explore CSR across a wider range of industries, particularly in emerging economies where regulatory frameworks are not robust but normative pressures are increasingly evolving. Including micro small and medium enterprises in the study could reveal how institutional theory applies to small businesses. Also, longitudinal studies would help in understanding how institutional pressures shape the sustainability and governance practices over time. While Institutional Theory offers a strong framework for understanding CSR and ESG evolution, the true influence of these initiatives depends on organizational culture and context.

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Obesity and Selected Health Outcomes in Sub-Saharan Africa: The Role of Regulatory Institutions

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Keywords

Obesity, Diabetes Prevalence, Cardiovascular Diseases, Life Expectancy, Generalized Method of Moment Estimation, Sub-Saharan Africa, Regulatory Institutions.

Abstract

This study examines how regulatory institutions moderate obesity to influence health outcomes in Sub-Saharan Africa (SSA). The system generalized method of moment estimation technique was applied to a panel data spanning the period 2005-2019 for twenty-six (26) SSA countries. Diabetes prevalence, mortality due to cardiovascular diseases and life expectancy at birth were employed as health outcomes in the study. The findings indicate that regulatory institutions moderate the negative impact of obesity on the selected health outcomes and promote health. In fact, regulatory institutions alone as measured by the rule of law do not have any significant effect on health outcomes. However, when rule of law is interacted with obesity, it reduces diabetes prevalence and death due to cardiovascular diseases by 0.008 and 0.13 percentage points respectively. In addition, when regulatory institutions moderate obesity, it improves life expectancy by 0.09 year over the study period. The study suggests that government regulatory institutions in SSA should be equipped with the necessary tools and legislation to enable them perform their functions diligently. The institutions should also be given the requisite resources to ensure periodic institutional review of performance all aimed at improving health outcomes.

Introduction

Over the years, infectious diseases such as hepatitis and measles have been key contributors to the disease burden in Sub-Saharan Africa (SSA). Countries in this region, like other developing countries are undergoing change in disease burden. Non-communicable diseases (NCDs) are becoming more prevalent as compared to communicable diseases (Gouda et al., 2019). Obesity is linked to a high probability of diabetes and heart disease (Katz, 2000). Obesity occurs when there is a mismatch between the energy consumed in food and the energy expended. The difference in energy is retained in fat cells, which grow and/or multiply (Bray, 2004). According to the World Health Organisation (WHO, 2020) obesity is used for any individual with a Body Mass Index (BMI) of 30 kg/m² and above. Obesity prevalence has increased worldwide, reaching alarming proportions, particularly in developing countries such as SSA. Obesity in childhood is also a serious problem because children are more likely to grow up to be obese adults with comorbidities (Keller and Torre, 2015).

Increased consumption of sugar sweetened beverages (SSBs) has been associated with weight gain due to high energy levels and low nutritional content, among other things (Katz, 2000). Obesity, which is related to risk of diabetes, cancer and dental disease, has been related to an increase in body mass. Obesity rates in SSA are predicted to rise, resulting in higher health-care costs. Increased use of SSBs has led to increased obesity prevalence and increased risks of heart diseases around the world (WHO, 2017). Western and Middle Africa are among the African regions with the least rates of obesity incidence. North Africa and Southern Africa, on the other hand, are among the African regions with rising obesity rates. South Africa is one of the Southern African countries that have recently seen a surge in obesity rates (Myers et al., 2015).

Diabetes in SSA is also on the rise. Although advancement in age is still a threat for Type-2 diabetes, it is anticipated that, there will be a trend toward earlier onset. In 2013, the reported diabetes cases in Africa were among those below the age of 60, with peak onset occurring between 40 and 59 years. Obesity and diabetes are currently prevalent among children and adults aged 18 years and above in 2021 (WHO, 2021). By sex demographics, the number of women with diabetes is higher than that of men. This is so

because women are more obese than men in the African sub region (IDF, 2019). These reports indicate that if nothing is done to decrease the region's increasing use of SSBs, the detrimental impact on health will be severe in the coming years.

Many high-income and some middle-income nations are focusing public health efforts on ways to induce sugar consumption reduction through health policy, public education campaigns and formal education in order to combat the rising prevalence of obesity and Type-2 diabetes. Similar attempts, on the other hand, are not as developed or as forthcoming in SSA due to high rates of illiteracy and weak regulatory institutions. Health-care systems across SSA are unprepared to deal with epidemic levels of NCD, especially when seen in the context of the ongoing fight against infectious diseases. Muth et al. (2019), for instance, reported that SSB taxes were effectively used to address childhood obesity in the US, leading to the prevention of 575,000 cases of childhood obesity and a health care savings of \$30.78 per dollar saved over 10 years. Thus, if these regulatory initiatives are implemented, it will help control or reduce the amount of energy intake of SSB's which in turn will help reduce the obesity level all other things being equal. Moreover, the WHO has recommended that governments should make settings where children meet be free from all unhealthy foods. They also added that regulatory policies for reducing diet-related diseases should be implemented.

In SSA, where a variety of marketing strategies targeted at younger people are used to assure brand awareness and influence purchase and brand loyalty, SSB already contribute significantly to total sugar and energy consumption. This, combined with a general lack of nutritional awareness or interest in preventative health, might lead to a young child's frequent ingestion of sugary drinks. To assist address this issue, they stated that enhanced efforts by governments and the nutrition community to educate the public on the health impacts of rising and excessive SSB consumption are required, and this calls for effective regulatory institutions

Literature Review

Few studies have examined the effect of obesity on selected health outcomes such as diabetes prevalence, CVDs and cancer in Africa. Agyemang et al., (2016) examined the prevalence of overweight and obesity in SSA, as well as their factors and links to CVDs and diabetes. Audain, Levy and Ellahi (2019) investigated the trends in early sugar-sweetened beverage (SSB) intake in SSA in the context of rising child and adolescent obesity and rising Type-2 diabetes prevalence. They examined ways to alleviate them, drawing on experiences from Africa and other parts of the world. The study suggested that SSB such as carbonated beverages and fruit juices, contribute to the development of obesity and related Non-Communicable Diseases (NCD). Msyamboza et al., (2013) corroborates that obesity is the most prevalent of the CVD risk factors among Malawian adults. When compared to people of normal weight, obese and overweight people had greater systolic and diastolic blood pressure, a potential predisposing factor for CVDs (Ayah et al. 2013).

In Tanzania, Njelekela et al., (2009) reports that a 1% rise in BMI was linked to a 10% increase in the risk of hypertension. In Nigeria, having a BMI of more than 25 raised the risk of hypertension by 12% (Okpechi et al, 2013). Furthermore, obese people had a higher risk of diabetes than persons of normal weight (Tibazarwa et al., 2009).

In a related study, Bray (2004) indicates that hypertension was prevalent in 44-51 percent of the patients in the Swedish Obesity study. According to estimates, controlling obesity would remove 48 percent of hypertension in whites and 28 percent of hypertension in blacks. The risk of myocardial infarction drops by about 2% for every 1 mm Hg reduction in diastolic blood pressure. The effects of obesity and hypertension on heart function are complex. Hypertension causes concentric hypertrophy of the heart and thickening of the ventricular walls in adults of normal weight. Eccentric dilatation occurs in overweight people while Hypertension is linked to increased prevalence of stroke. Coronary heart disease (CHD) is the main cause of death in affluent countries and one of the top causes of disease burden in developing countries (Gaziano et al. 2009).

Furthermore, Cresswell et al. (2012) investigated whether maternal obesity is a risk factor for newborn death in SSA as well as the impact it has on the precise timing of death during the neonatal period. A total of 27 SSA countries' cross-sectional demographic and health surveys (2003-2009) were

merged. They employed multivariate logistic regression to analyze the risk of newborn death by obese mothers. After controlling for confounding factors, maternal obesity was linked to a higher risk of newborn death. Obesity in the mother was found to be a substantial risk factor for newborn mortality in the first two days of life. Because of the insufficient statistical power, they found no statistically meaningful relationship later in the neonatal period. As a result, they came to the conclusion that maternal obesity is linked to an increased risk of early newborn death in SSA.

Despite the fact that there have been studies on obesity and its health effects in SSA, none of these studies have examined how government policies via its regulatory institutions help reduce obesity rates in SSA using the generalized method of moment (GMM) methodology. This study examines the effects of obesity on diabetes prevalence, mortality due to cardiovascular diseases and life expectancy. Second, we examine the effects regulatory institutions have on diabetes prevalence, mortality due to cardiovascular diseases and life expectancy and finally we examined how regulatory institutions moderate obesity on diabetes prevalence, mortality due to cardiovascular diseases and life expectancy. The study advances the literature on the effect of obesity on health outcomes by examining the role of quality regulatory institutions.

The rest of the paper is organized as follows. The next section discusses methodology and data requirements. Discussion of the results of the study continues thereafter and the final section summarizes the main findings and policy implications of the study.

Methodology and Data

Grossman's (1972) "demand for health" model which was later simplified and extended by Wagstaff (1986) is the underpinning theory for this study. Using the health production concept, we assume that people manufacture health by utilizing various socio-economic and non-socio-economic variables. Thus, health is a function of various health inputs which is mathematically written as:

$$\text{Health} = f(\text{socio-economic and non-socio-economic variables}) \quad (1)$$

$$\text{Health} = f(E, I, O, H, D, R, B, \dots, P) \quad (2)$$

Where;

E= Education; I= Income; O= Occupation

H= Healthcare services

D= Diet; R= Recreation

B= Behavioral lifestyles such as alcohol consumption and smoking

P= Physical exercise

In line with the objectives of this study, we investigated the importance of regulatory institutions moderating obesity in achieving better health outcomes as shown below;

$$\text{Health outcomes (HO)} = f(\text{OB, LAW, Z}) \quad (3)$$

Where HO is the selected health outcomes (mortality due to CVD, diabetes prevalence and life expectancy)

OB is obesity prevalence

LAW is institutional/regulatory quality

Z is a vector of control variables

We then interact the variable LAW with OB in order to find out whether the strength of the relationship between obesity and the selected health outcomes is affected by the presence of regulatory institutions. According to the literature, the important variables that determine diabetes prevalence, CVD mortality, and life expectancy are the control variables. The variables are the percentage of the population living in cities (urbanization), GDP per capita, unemployment, immunization and the prevalence of undernourishment. The dynamic form of the model is as follows:

$$HO_{it} = \beta_0 + \alpha HO_{it-1} + \beta_1 OB_{it} + \beta_2 LAW_{it} + \beta_3 OB_{it} * LAW_{it} + \beta_4 UnNOR_{it} + \beta_5 UnEMPLOY_{it} + \beta_6 UrPOP_{it} + \beta_7 GDPC_{it} + \beta_8 DPT_{it} + \varepsilon_{it} \quad (4)$$

Where, HO, OB and LAW are as previously defined.

HO_{it-1} and HO_{it} are the first lag and current levels of the selected health outcomes respectively,

$OB * LAW$, is the interaction (product) of obesity prevalence and institutional quality,

DPT is the percentage of population who have been immunized

UrPOP, is the percentage of the population living in urban areas,
 GDPC, is gross domestic product per capita,
 UnEMPLOY, is the rate of unemployment
 UnNOR, is the percentage of the population who are undernourished,
 β_0 , is the intercept,
 ε , is the random error term,
 it , refers to country i ($i=1 \dots 26$) at time t ($t=2005 \dots 2019$) and
 $\beta_0 \dots \beta_9$, are all coefficients.

Dependent Variables

Mortality from cardiovascular (MCVD): CVDs are a group of heart and blood vessel problems. Obesity is a major contributor to these deaths. This was measured by the percentage of the population dying from cardiovascular diseases.

Diabetes prevalence (Diabetes): Diabetes is a condition in which your blood glucose, often known as blood sugar, is abnormally high. High glucose levels are linked to long-term harm to the body and the failure of many organs and tissues (WHO, 2021). This was also measured by the percentage of the population between the ages of 20 to 79 who have diabetes.

Life expectancy (LE): The term "life expectancy at birth" refers to how long a newborn infant would live if current mortality statistics at the moment of birth remained constant throughout his or her life. It has been widely accepted in the literature as the most reliable and consistent indicator of overall health (Nixon and Ulmann, 2006). To account for the whole health situation of the countries under consideration, life expectancy at birth was chosen.

Independent variables

Obesity prevalence (OB): Obesity is used as one of the explanatory variables because obesity is a risk factor for majority of CVDs that affects health. Hence, we predict obesity to raise diabetes, CVD-related mortality, and shorten life expectancy. This was measured by the percentage of the adult population who are obese.

Institutional quality (LAW): The effectiveness of policies and institutions has a significant impact on the degree to which quality institutions enhance health status. We utilize Douglas North's definition of institutions, which asserts that institutions are those formal and informal standards of procedure, as well as the enforcements that go along with them (North, 1991). The World Bank worldwide governance indicator has identified six different indicators as a way of measuring the quality of governance in various countries across the globe. Voice and Accountability, Political Stability, Government Effectiveness, Rule of Law, Regulatory quality and Control of Corruption are the various indicators proposed by the World Bank. This study used rule of law as the measure for institutional/regulatory quality. This measure was used because it offers a detailed measure of the extent to which countries adhere to the rule of law in practice places strong emphasis on institutional frameworks and how they function which is in line with the objective of this study.

Child immunization measures the percentage of children aged 12-23 months who received vaccinations before 12 months or at any time before the survey. A child is considered adequately immunized against diphtheria, pertussis (or whooping cough), and tetanus (DPT) after receiving three doses of vaccine. This variable was added as a control variable because vaccines help the immune system to be stronger thus helping people live longer.

Unemployment was used a control variable because it has adverse effects on health. Smoking, alcohol consumption and stress are increased after the onset of unemployment which decreases life expectancy. Also, *urbanization* poses health problems such a poor nutrition, diabetes and communicable diseases. Since diabetes and life expectancy are used as dependent variables in this study, urbanisation was added to control for its effect on these dependent variables. Several studies, including Musgrove (1996) and Gupta et al. (2002), imply that as a nation's per capita income rises, so does its population's health. This emphasizes the importance of GDP per capita in affecting health condition. Finally, *undernourishment* was included to account for the impact of diet on health outcomes.

Estimation Technique

The presence of potential endogeneity in the model makes using OLS to estimate the model difficult: the results will be inconsistent and biased. Although alternative estimation strategies exist to deal with the endogeneity problem, the dynamic panel model works best with the Generalized Method of Moment (GMM) estimation technique because it can handle the dynamic panel bias problem caused by endogeneity. Important approaches for estimating the model include the use of Instrumental Variable (IV) and Two-Stage Least Squares (2SLS) estimates. Both techniques, however, rely on external instruments. The problem with employing external instruments is that they are frequently ineffective and cannot meet the "validity and relevance" criterion, resulting in an impartial estimate (Blundell & Bond, 1998). Again, obtaining instruments that are associated with endogenous variables while being uncorrelated with stochastic error terms is a challenge. In this case, the GMM approach is the better option since it makes use of the lags of the endogenous variables as the instruments. According to Blundell and Bond (1998), the system GMM employed in this study makes an assumption about the initial circumstances in order to obtain moment conditions that are useful for even persistent series and have been proved to perform well in simulations.

Data

The data on institutional quality came from the World Bank's governance indicators' rule of law component, while the rest of the data on both dependent and control variables came from the World Bank's World Development Indicators, which covered 26 SSA nations from 2005 to 2019. The countries were chosen based on the availability of data. Countries in the region that lacked data for either of the dependent variables or the variables of interest were left out. Countries that lacked data for more than one of the control variables were also eliminated.

Results and Discussion

The study covered twenty-six (26) SSA countries spanning the period 2005 to 2019. The empirical estimations were computed using StataCorp's statistical software version 13.1 (STATA 13). The results from the multicollinearity test (see Table 3 in appendix) revealed that there was no significant correlation between the variables; however, the heteroskedasticity test (see Table 4 in appendix) rejected the null hypothesis of constant variance for all equations. The endogeneity test (see Table 5 in appendix) on the other hand, indicated that the rule of law, per capita income, and immunization are all endogenous with diabetes prevalence and life expectancy. At a 1% level of significance, the inverse chi-squared test revealed that none of the variables have a unit root.

All the selected SSA countries had information on all of the variables making the panel balanced. From Table 1, the average values for the dependent variables: mortality due to cardiovascular diseases, diabetes prevalence and life expectancy are 24.54, 7.2 and 59.18 respectively. This means 24.54% of population die from cardiovascular diseases on average in SSA and 7.2% of the population between the ages of 20 and 79 on average have diabetes in SSA. Life expectancy on average in SSA however is 59 years. The percentage of children who were immunized had a minimum and maximum value of 36 and 99 respectively. Obesity had a 28.59 percent average rate. LAW had a 5.48 mean value and a 0.53 standard deviation

Table 1: Summary statistics of all variables used in the estimation

Variable	Mean	Std. Dev.	Min	Max
Mortality from CVD (MCVD)	24.54	5.51	15.9	48.1
Diabetes	7.2	1.7	3.3	13.5
Life expectancy (LE)	59.18	5.97	42.60	74.51
Obesity (OB)	28.59	7.23	15.9	55.1
Rule of law (LAW)	5.48	0.53	4.52	7.03
Per Capita Income (GDPC)	2165.57	2529.61	162.43	11208.34
Undernourishment (UnNOR)	19.32	10.63	3.5	52.2
Unemployment (UnEMPLOY)	7.86	7.01	0.8	30.78
Urban Population (UrPOP)	43.33	16.95	15.05	89.74
Immunization (DPT)	81.07	13.80	36	99

Source: Authors' Computation Using Stata 13.1

Table 2: GMM estimates of the effects of obesity, regulatory institution and interaction of regulatory institution and obesity on life expectancy, diabetes prevalence and mortality due to CVDs in SSA.

VARIABLES	(1) LE	(2) Diabetes	(3) MCVD
LLE	1.003*** (0.00348)		
OB	-0.548*** (0.0466)	0.0344* (0.0195)	0.765*** (0.288)
LAW	-2.810*** (0.228)	0.294*** (0.113)	3.904*** (1.458)
OB*LAW	0.0925*** (0.00758)	-0.00767** (0.00337)	-0.131*** (0.0474)
UnNOR	0.00610*** (0.00130)	0.000495 (0.00106)	-0.0175 (0.0112)
UnEMPLOY	0.0253*** (0.00320)	0.0137*** (0.00250)	-0.00394 (0.0297)
UrPOP	0.00508*** (0.00164)	0.00349*** (0.00116)	-0.00685 (0.00579)
GDP	-0.209*** (0.0442)	-0.0501*** (0.0140)	-0.0927 (0.0881)
DPT	0.00944*** (0.00207)	-0.00142** (0.000553)	-0.0101* (0.00515)
LDiabetes		0.998*** (0.00514)	
LMCVD			1.043*** (0.0250)

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

From our results, obesity has a negative and significant effect on life expectancy and a positive and significant effect on mortality due to cardiovascular diseases and diabetes prevalence. A percentage point increase in obesity rate in SSA will lead to a 0.55 year decrease in life expectancy all other variables held constant. This corroborates findings from Peters et al. (2003), Lartey et al. (2020) and Adair and Lopez (2020). Diabetes prevalence and mortality due to cardiovascular diseases will also increase by 0.03 and 0.77 percentage points respectively as obesity rate increases by one percentage point. The coefficients were statistically significant at 1%, 10% and 1% respectively. Obesity decreases life expectancy because obese individuals are at a higher risk of developing so many other medical complications such stroke and CVDs. This results in the probability of early deaths thus decreasing life expectancy. This meets our a priori expectation because theoretically, using the health production function, an individual combines both socio-economic and non-socio-economic factors to produce health. Hence, all other factors equal, if these health inputs are positive, we expect an individual to be healthy. On the contrary, obesity mainly is as a result of consuming a lot of SSB's and fatty foods. Since these inputs are detrimental to the health of an individual, we expect adverse effects on our health outcome measures. Obesity in adulthood is linked to shorter life expectancy and higher rates of early mortality. These decreases in life expectancy are comparable to those reported in smokers. Obesity and its associated health impacts are becoming more common among older persons in resource-poor nations (Lartey et al., 2020).

Obesity is also a risk factor for diabetes, and being obese is the sixth most important risk factor contributing to the worldwide disease burden (Tibazarwa et al., 2009). The association between SSB's and obesity has long been known. Our findings revealed that, if all other factors remain constant, a percentage point increase in obesity rate will result in a 0.03 percentage point increase in diabetes prevalence in Sub-

Saharan African countries. This happens because obesity leads to the development of insulin resistance which is a precursor for Type 2 diabetes. This was supported by Audain et al. (2019), who found that a 1% increase in SSB consumption was connected to an additional 0.3 diabetic adults per 100 people in 165 countries. Obese individuals also had a higher risk of diabetes than normal-weight people (Tibazarwa et al., 2009).

Obese individuals also have more CVD risk factors than healthy people (Ayah et al., 2013, Njelekela et al., 2009). Our findings did not prove otherwise. A percentage point increase in obesity rate increases mortality due to cardiovascular diseases by 0.77 percentage point in SSA. This occurs because obesity leads to structural and functional changes of the heart leading to heart failure. Obesity was shown to be the most common CVD risk factor. In Tanzania, a 1% increase in BMI was associated with a 10% increase in the risk of hypertension (Njelekela et al., 2009). A BMI of greater than 25 increased the risk of hypertension by 12% in Nigeria (Okpechi, 2013). This means that weight-loss-promoting policies and procedures must be introduced as soon as possible in the region. Adult obesity is a strong predictor of death at a later age. Obesity prevention and treatment should be given prominence in public health as the prevalence of the epidemic rises. The impact of adult obesity on life expectancy and early death is dramatic.

Table 2 also revealed that, holding other variables constant, the presence of rule of law has a positive and significant influence on mortality due to cardiovascular diseases and diabetes prevalence, as well as a negative and significant effect on life expectancy. Even though we expected rule of law which represents institutional quality to have positive and significant effect on life expectancy and a negative and significant effect on mortality due to cardiovascular diseases and diabetes prevalence, our findings proved otherwise. A unit increase in rule of law holding all other variables constant decreased life expectancy by 2.8 years and increased diabetes prevalence and mortality due to CVDs by 0.29 and 3.90 percentage points respectively. These coefficients were statistically significant at 1%. This showed that the presence of rule of law does not necessarily have positive impact on health outcomes. It has to be moderated with a variable of interest (obesity) in the case of our study through which it will have a positive impact on health outcomes. Hence, according to our findings, holding all other variables constant, rule of law moderating obesity reduces diabetes prevalence and death due to cardiovascular diseases by 0.007 and 0.13 percentage points respectively. Also, it results in a 0.09-year improvement in life expectancy in SSA. These coefficients were also statistically significant at 5%, 1% and 1% respectively. The results demonstrated that the interacted variable's moderating role in influencing obesity is extremely important in having a positive impact on health outcomes. The interaction of obesity and quality regulatory institutions, as measured by the rule of law, is crucial in reducing diabetes prevalence and death from cardiovascular diseases, as well as improving life expectancy. Given the high incidence of obesity, our findings demonstrated that effective institutions are critical in achieving better health outcomes. Pinzon-Rondon et al. (2015) opined that institutions, rather than any other variable capable of predicting health outcomes, play a major role in achieving better health outcomes. As a result, countries with stronger regulatory institutions will have lower SSB intake and thus lower obesity rates, while countries with weaker regulatory institutions will have higher SSB consumption and obesity rates all other things being equal.

Conclusion and Policy Implications

Obesity prevalence must be reduced in order to have improved health outcomes, according to the literature. This alarming situation prompted this research into how quality regulatory institutions might help the region achieve better health outcomes through reduction in obesity prevalence. As a result, many governments across the globe, particularly those in SSA, must commit major amounts of their revenues to strengthening their regulatory institutions to aid reduce obesity prevalence. Obesity prevalence has a negative significant influence on life expectancy and a positive significant effect on mortality due to cardiovascular diseases and diabetes prevalence, according to our findings. A percentage point increase in obesity rates in SSA will lead to a 0.55 year decrease in life expectancy all other variables held constant. Diabetes prevalence and mortality due to cardiovascular diseases will also increase by 0.03 and 0.77 percentage points respectively as obesity rate increases by a percentage point. In terms of the interacting

variable (rule of law), it was discovered that, holding all other variables constant, rule of law moderating obesity reduces diabetes prevalence and death due to cardiovascular diseases by 0.007 and 0.13 percentage points respectively. Also, it results in a 0.09-year improvement in life expectancy in SSA. These coefficients were also statistically significant at 5%, 1% and 1% respectively.

Given the findings of this study, SSA's regulatory institutions should be enhanced by establishing clear policies on norms and processes to be followed in order to achieve the goal of lowering obesity prevalence in the region. To manage the amount of sugar in their beverages, regulatory agencies must oversee the sugar sweetened beverage industry. This is critical because the use of SSBs is a major contributor to rising obesity rates in SSA. This calls for minimizing corruption and providing management of the various health-care organizations with the resources and authority they require to carry out their duties.

Limitation and direction for future research

We do not recommend generalizing the findings due to the small number of SSA countries (26) considered in the study. As a result, the conclusions of this study are confined to the countries examined. Data on SSB's was unavailable impacting on the results of this research. We propose that more studies be conducted at the individual country level to capture how regulatory institutions and education can influence obesity in reducing diabetes prevalence and mortality due to cardiovascular diseases as well as increasing life expectancy. Childhood obesity is on the rise hence future research should focus on the effects of childhood obesity and its health consequences in SSA. Furthermore, we also recommend future researchers to analyze the healthcare cost imposed by obesity in SSA. Moreover, due to the increasing prevalence of cancer in SSA, obesity has been observed to be one of the key factors to cancer deaths, hence further research should focus on economic cost incurred on cancer treatment due to obesity prevalence in SSA.

APPENDIX

Table 3: Correlation matrix

	OB	LAW	UnNOR	UnEMPLOY	UrPOP	GDP	DPT
OB	1.0000						
LAW	0.3683	1.0000					
UnNOR	-0.3684	-0.3568	1.0000				
UnEMPLOY	0.7595	0.3346	-0.2508	1.0000			
UrPOP	0.6517	-0.0606	-0.2200	0.4529	1.0000		
GDP	0.6368	0.4838	-0.2826	0.5361	0.6219	1.0000	
DPT	0.1289	0.5844	-0.0977	0.0795	-0.2035	0.0198	1.0000

Source: Authors' Computation using Stata 13.1.

Table 4: Breusch-Pagan/ Cook- Weisberg test for heteroskedasticity

Null Hypothesis (H_0): Constant variance (homoskedasticity is present)

Alternative Hypothesis (H_A): Heteroskedasticity is present

Null Hypothesis: Constant variance		
Output for MCVD	chi2 (8) =	249.69
Prob>chi2 =	0.0000	
Output for Diabetes	chi2 (8) =	271.61
Prob>chi2 =	0.0000	
Output for LE	chi2 (8) =	206.60
Prob>chi2 =	0.0000	

Source: Authors' Computation Using Stata 13.1

Table 5: Durbin- Wu Hausman (DWH) Test for Endogeneity

Null Hypothesis	P-value (Prob> Chi2)
LAW	0.0000
GDP	0.0000

UnNOR	0.0000
UnEMPLOY	0.0000
DPT	0.0000
UrPOP	0.0005

Source: Authors' Computation Using Stata 13.1

Table 5 shows that LAW, GDPC, UnNOR, UnEMPLOY, DPT and UrPOP are endogenous. Thus, they are specified in the GMM for their respective dependent variables with which they are endogenous.

Table 6: List of countries

Angola, Benin, Botswana, Burkina Faso, Congo Republic, Cameroon, Cote D'Ivoire, Ethiopia, Gabon, The Gambia, Ghana, Kenya, Lesotho, Liberia, Malawi, Mali, Mauritania, Mauritius, Mozambique, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Tanzania and Togo.

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A conceptual framework for Chief Information Officers (CIO), IT strategy and IT disconnect; in organizations to deliver their expectations in the African context

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Keywords

CIO, Digital leadership, IT disconnect, IT strategy, Organization expectation

Abstract

Purpose of the research- Traditionally, the focus of the digital leaders was on information technology (IT) stability and operational efficiency, but these areas are now table stakes, and top chief Information Officers (CIOs) collaborate with executive counterparts to identify potential for growth enabled by technology. As the boundaries between products, services, and technology become hazier, the CIO is expected to help make a difference at the front end, improving the customer experience and supporting revenue and growth. However, most IT tasks are not connected with the futurist demand thus creating a disconnect that affects the overall performance of the organization. IT disconnect is prominent on the African continent because most CIOs are not part of the top management thus affecting IT alignment in organizations. The purpose is to develop a framework to help organization deal with all aspect to enable them achieve expected outcomes on the African continent and beyond.

Design/methodology- This study used qualitative approach by talking to practitioners in the field of business and IT in the African context. In order to obtain a thorough understanding of the framework for the constructs (Chief Information Officers (CIO), IT strategy, IT disconnect and expectation of organizations). Case studies and interviews were used as two main data collection techniques.

Results/findings- This IT disconnect is prominent on the African continent because most CIOs are not part of the top management thus affecting IT alignment in organizations. Unlike most organizations in the West, including Universities, the designation of CIO is not part of the IT structure thereby enforcing the IT disconnect.

Practical implications and Conclusions -The digital divide between the western world and the African continent is evident. The CIO's role goes beyond IT; however, the IS literature has mostly overlooked the issue of whether African CIOs as change agents who need additional skills sets that can make them effective. CIOs who will ensure that they invest in an IT strategy that improve the businesses expectations. CIO will have to be mindful that IT that disconnects will adversely affect the enterprise. Using the theories of diffusion of innovation, dynamic capabilities and transformational leadership managers of organizations will appreciate practices is can be theorized.

Introduction

CIOs are now leading digital transformation, with an emphasis on harnessing data in generative AI, automation, and proactive cybersecurity projects to give concrete business benefits. Instead of just ensuring that the phones and networks are operational, CIOs must have skills set that goes beyond just the IT but are crucial, for contemporary businesses alignment which focus on business value. Using technology to generate income, develop new goods and services, and increase efficiency and production is increasingly necessary for any CIO. Businesses concentrate on data, including bringing big data to life inside the organizations for analytics insights and AI projects. Additionally, a lot of focus is placed on the customer experience and demonstrating the value of solutions both internally with their clients and externally with their business partners.

According to Gartner's 2024 CIO Agenda poll, 18% of CIOs oversee non-IT tasks, and 80% of CIOs have broadened their responsibilities (Gorgeon, 2024; Hillebrand & Westner, 2022) beyond IT as part of their core function in their organization. CIOs' responsibility to manage change is being accelerated by waves of digital advancements. CIOs need to be strong change agents in order to be relevant and

productive in their leadership positions. Their lengthier tenure allows them to more successfully finish their transformational journeys (Gorgeon, 2024). However, the IS literature has mostly overlooked the issue of the African CIO as change agents who need additional skills sets that can make them as effective at the start to finish their mandate (Grego, 2025). This study aims to close the gap by analyzing how and why the function of CIOs in Africa advances beyond IT skills. Using the findings of a revelatory case study of the CIOs of a company, as well IS literature (Schmitt, 2024; Steelman, 2024), this research presents a model that explains the mix of how CIOs throughout their tenure will understand organization strategy, IT strategy, IT disconnect can impact enterprise expectations by enhancing the client experience while promoting income and expansion. This disconnect happens more on the Africa continent than where internet connectivity is mostly limited to the major cities.

Literature review

The ability of leaders to negotiate the intricacies of many digital technologies and their impact on enterprises should be known as digital leadership. According to Northouse (2018), in addition to technical expertise, effective leadership in a digital environment necessitates the capacity to promote an innovative and flexible culture. Prioritizing digital efforts allows leaders to inspire their staff to adopt new technologies, increasing the chances of a successful digital transformation (Brown & Green, 2023). Contemporary CIOs should have a deeper understanding of how critical and dynamic the business environment is in relation to the specific industry and the global interplay among different organizations ecosystems. The literature on the digital leaders excludes the sub-African continent. Most of the CIO's studies are in developed economies totally neglecting the African continent and the sub region; for example, Xia et al. (2023) in China, Brown and Green (2023) in Germany, Bendig et al. (2023) in the U.S. and Gottschalk (1999) in Norway. This study seeks to fill this gap and contribute to the literature and the theories underlying the various research work. As organizations are subject to constant change, so are the requirements of the CIO role. According to Chun and Mooney (2009) and Smaltz et al. (2006), even within a single organization, a CIO has multiple roles depending on the organization's needs. For instance, Smaltz et al. (2006) identifies six key roles of a CIO and divides them into supply-side roles, running the IT, demand-side roles, and enabling new business opportunities.

Peppard et al. (2011) argue that different CIO roles are required depending on an organization's information leadership capabilities and its need for IS/IT supporting competitive differentiation.

Maintaining an effective alignment with the environment while managing internal interdependencies is a dynamic process that involves many decisions and behaviors at multiple organizational levels. This process is extremely complicated for the majority of firms (Miles et al., 1978). It is important as part of the business strategy for IT to clearly understand where the business is heading: if IT does not understand this proposition then IT investment is not worth it and by extension the CIO is not competent to lead the IT staff. IT strategy outlines what IT must accomplish, what it must modify, and what it must not do. The IT strategy is completed by the ancillary multiyear and annual plans and budgets, which outline the actions that IT and the company must take to achieve the IT and business strategies. Joining the enterprise management team, if not as a decision maker, then at least as a first-hand observer, is one of the advantages of an IT strategy for IT. This leads to closer relationships with business decision makers, who are the source of business knowledge (Boar, 1994). CIOs must use and improve the company's digital assets to achieve business goals and effectively drive the digital business transformation. The skills and viewpoints of CIOs differ from those of traditional leaders. However, a lack of understanding of the value of CIO by many businesses results in subpar performance and irreparable failures. Following an analysis and clarification of the modern-day concept of digital leadership, as well as a review of variable business strategies and the positioning of the leadership concept across various sectors, this research paper shows a strong correlation between CIOs, corporate success and productivity (de Araujo, 2021).

Constructs	Objective	Reference	Context
Organization strategy	Organizational strategy, structure, and process	Miles et al. (1978)	Management review and four industries (college textbook publishing, electronics, food processing, and health care

	Foundations of organizational strategy	Jensen (2001)	Rochester and Harvard.
	What is organizational strategy?	Mantere (2013)	English language
	Industrial organization, corporate strategy and structure	Caves (1980)	Europe
	Competitive strategy and organizational performance	Zairbani and Prakash (2025)	Systematic literature review
	Artificial intelligence and organizational strategy: Ethical and governance implications	Norton (2025)	
Digital Leadership (CIO)			
	CIO leadership, employee digital ability, and corporate green innovation performance	Xiufan and Yunqiao (2024)	Europe
	Success factors of long-term CIOs	Hillebrand and Westner (2022).	Top-tier companies Germany
	The impact of digital leadership on teachers' technology integration during the COVID-19	Alajmi (2022).	Kuwait
	Impact of digital leadership capability	Benitez et al. (2022)	European firms.
	Tenure and background of CIOs in Germany	Hillebrand and Westner (2023)	Germany
	25 years of CIO and IT leadership		
	Exploring the impact of a chief information officer in the top management team	Bendig et al. (2023)	U.S. firms
	Shaping innovation outcomes: The role of CIOs for firms' digital exploration	Schäpe et al. (2025)	U.S. firms
IT strategy	IT strategy and planning	Khaw et al. (2022)	Systematically reviewed
	IT architects and IT-business alignment:	Gellweiler (2022)	Theoretical review
	Factors affecting IT and business alignment	Njanka et al. (2021)	London, Latin American and Caribbean
	Strategic management of IS/IT functions	Gottschalk (1999)	Norwegian
IT disconnect	The digital disconnect. Pew Internet and American Life Project, Washington, DC.	Levin, Arafah, and Rainie-Director (2002)	USA
	The digital disconnect: The social causes and consequences of digital inequalities	Helsper (2021)	Europe
	The 'Twilight' of Health, Safety, and Well-being of Workers in the Digital Era-Shaping the Right to	Zlatanović and Škobo (2024)	Europe

	Disconnect.		
	Digital disconnection, digital inequality, and subjective well-being:	Nguyen and Hargittai (2024)	Dutch participants
Enterprise expectations	Expectations of industrial enterprises towards suppliers related to management	Urbaniak et al. (2023)	Polish B2B market
	Digital transformation, sustainability, and purpose in the multinational enterprise	George and Schillebeeckx (2022)	Multinational enterprise
	The enterprise activism risk model: How good intentions can jeopardize business success	Whitler and Barta (2024)	Europe
	The impact of digital transformation on enterprise green innovation	Xu et al. (2024)	China
	Information support for managing energy-saving technological changes at enterprises	Yemelyanov et al. (2023)	Ukrainian enterprises

Table 1.0: Constructs**Theoretical context****Diffusion of Innovation Theory**

Everett Rogers Diffusion of Innovation Theory in 1962, offers a thorough framework for taking into account how new concepts, innovations, or technologies proliferate within a community or organization (Prasad Agrawal, 2023). The theory sheds light on the dynamics of technology adoption and how it affects organizational innovation. AI has innovative qualities that affect its uptake, such as the capacity to generate new content or solutions on its own. According to Hsu and Ching (2023), these qualities include the perceived benefits of GenAI in terms of creativity development, efficiency gains, and adaptive problem-solving. Therefore, it is critical to comprehend IT strategies and qualities as they are essential to the adoption of AI. Additionally, the theory broadens its scope of application to the study's central examination of exploitative and exploratory innovation (Enkel et al., 2017). Because AI, ML and data analytics promotes experimentation, it becomes a catalyst for exploratory innovation. According to Cooper and Morris-Suzuki (1998), early adopters of technology demonstrated a spirit of technological exploration frequently and enthusiasm by integrating. IT creates the framework for making well-informed decisions.

In contrast, the later phases of diffusion also see a rise in exploitative innovation (Enkel et al., 2020; Zhang & Luo, 2020; Wael AL-Khatib, 2023; 2017).

As businesses diversify the challenge and possibilities of AI to concrete advantages to organization are enormous. The main goal of exploitative innovation is to improve and optimize the way GenAI is integrated into current organizational procedures.

Dynamic Capabilities Theory

Dynamic Capabilities Theory (DCT), which emphasizes organization ability to recognize, seize, and transform opportunities in response to environmental shifts, is a complement to OLT and helps to further solidify the role of digital leadership in sustainable business transformation (Malakar et al., 2025). Successful digital leaders demonstrate dynamic capabilities by incorporating sustainability-driven digital innovations, keeping a close eye on technology developments, and strategically reallocating resources to meet long-term economic and environmental objectives. Innovative leaders create resource-efficient, ecologically conscious business models by leveraging cutting-edge technologies like blockchain, artificial

intelligence (AI), and the Internet of Things (IoT) (Ávila-Robinson et al., 2022). These leaders create an organizational culture that encourages ongoing learning, creativity, and adaptive innovation by integrating digital solutions into sustainability strategies (Cai et al., 2024; Naqshbandi et al., 2023).

Transformational Leadership Theory

Transformational leadership theory claims that digital leadership positively influences the acceptance of digital innovation. Transformational leaders foster an environment of trust, innovation, and commitment to a shared objective, motivating and uplifting their teams to attain remarkable outcomes. Zheng et al. (2024) assert that leaders who adopt digital transformation are more inclined to implement practices that foster sustainability and green innovation.

Methodology

Qualitative Research Design

In order to obtain a thorough understanding of the framework for constructs (Chief Information Officers (CIO), IT strategy, IT disconnect and expectation of organizations) this study used qualitative approach by talking to practitioners in the field of business and IT in the African context. We use case studies and interviews as our two main data collection techniques to achieve this. By using these strategies, we are able to document the complex viewpoints and experiences of business executives and CIOs negotiating the difficulties of digital transformation. Rich, context-specific insights that quantitative methods might miss are made possible by the qualitative nature of this study. This design provides a more comprehensive understanding of how businesses can effectively hire CIOs who will provide digital leadership and lead digital strategies, and incorporate these strategies by making sure their IT is not disconnected from their business expectation.

Data Collection Methods

We conducted semi-structured interviews with IT directors (CIOs) and business executives from a variety of industries and 16 public universities in order to collect relevant data. This format was selected to ensure that important issues pertaining to digital leadership and enterprise expectations are covered while promoting an open discussion.

Through the interviews, ICT directors and management of the organization we used had an online forum to discuss their experiences, obstacles, and tactics for integrating IT strategies into their companies. A few case studies of businesses that have successfully incorporated IT strategies and digital leadership into their operational frameworks was examined. By providing real-world examples of best practices, these case studies enhanced our comprehension of the subject by demonstrating how these companies have effectively merged their digital transformation and sustainability initiatives by avoiding IT disconnect.

Data Analysis Approach

Thematic analysis, a qualitative technique that focuses on finding, examining, and summarizing patterns or themes within qualitative data was used for data analysis. This method enabled us to methodically analyze the information obtained from case studies and interviews, emphasizing the major themes associated with IT strategy and digital leadership organization expectation. We were able to deduce significant connections between IT strategy, digital leadership organization expectation and IT disconnect by looking at the results of case studies and interview transcripts. We investigated the breadth and depth of participants' experiences through the use of thematic analysis, which offers a thorough grasp of how digital leadership promotes successful digital transformation process. In the end, this analytical framework directed our investigation of the complex connections between the variables of interest in our research.

Theoretical framework and Hypothesis development

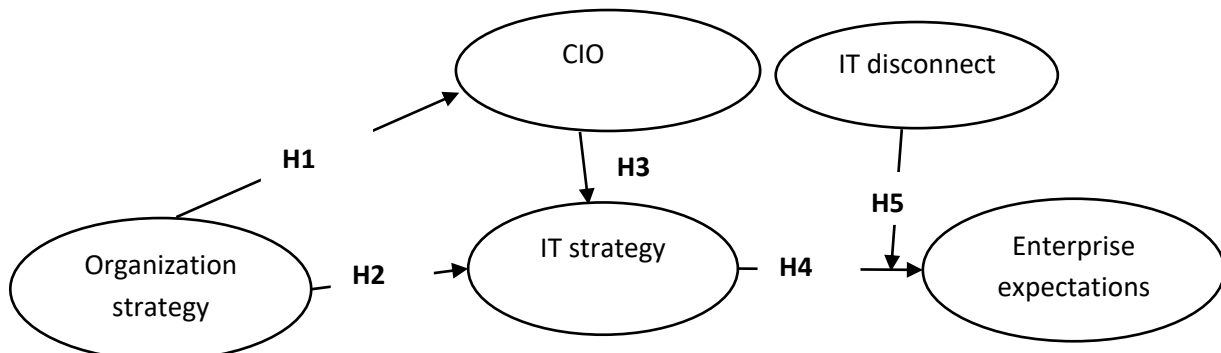


Figure 1

Hypothesis 1: Organization strategy and Chief Information Officer (CIO)

We hypothesize that organization strategy positively influences the CIO who is employed in an organization. Every organization must have a strategy to achieve its objectives: how to execute this strategy requires the needed personnel to deliver this strategy. According to Freedman (2003), this organizational framework should have alternatives that define its present and future operations, as part of an overall organismal strategy. While it is largely accurate to claim that the development and execution of a strategic plan are pivotal managerial functions, among the multitude of activities undertaken by managers, few exert as profound an influence on the organization's performance.

Over time as the manner in which the management team navigates the responsibilities of steering the organization's long-term goals and objectives through effective leadership to achieve the desired outcomes (Muthimi & Kilika, 2018). This strategy should inform the kind of competencies and personnel that are employed. The CIO position is a senior management position in IT, the CIO leads the organization ICT strategy in contemporary businesses so organizations employing CIOs should critically examine the person to occupy that position as part of the organization's strategic posture. Digital leadership is defined as the ability of leaders to navigate the complexities of digital technologies and their implications for organizations. Effective leadership in a digital environment necessitates not only technical proficiency but also the capacity to promote an innovative and flexible culture, according to Northouse (2018). Prioritizing digital efforts allows leaders to inspire their staff to adopt new technologies, increasing the chances of a successful digital transformation (Brown & Green, 2023). Effective digital leaders exhibit dynamic capabilities by continuously monitoring technological advancements, integrating sustainability-driven digital innovations, and strategically reconfiguring resources to achieve long-term environmental and economic goals.

Hypothesis 2: Organization strategy and IT strategy

We hypothesize that organization strategy positively influences IT strategy. Studies that examined the potential effects of GenAI on an organization's business strategies are available (Kanbach et al., 2023; Peres et al., 2023). Studies have also looked at how GenAI could help with precise decision-making in order to enable faultless predictive analysis, which may ultimately result in wise strategic decisions (Peres et al., 2023). As a result, there is a good chance to look into how implementing GenAI as part of organizational strategy will affect IT strategy from the future performance. A careful and strategic approach is required as organizations traverse its strategy frontier in order to fully benefit from AI, machine language, cyber security, data analytics etc. This investigation into organization strategy, which includes IT strategy that involves AI and other disruptive IT technologies applications, is part of a larger framework for comprehending its effects on organizational performance in greater detail (Olan et al., 2022).

Hypothesis 3: CIO and IT strategy

We hypothesize that a CIO will positively influence IT strategy. Nash (2009) revealed that almost one out of four CIOs had been fired due to poor performance. Currently, there is evidence that CIOs are becoming more comfortable in their roles and are staying in them for longer (CIO Magazine 2020); however, the consulting firm Korn Ferry reports that CIOs continue to have significantly shorter tenures (4.6 years) than CEOs (6.9 years) (Korn Ferry, 2020). Other research also finds that most CIOs have been in their roles for three years or fewer, even if tenures are generally rising (CIO Magazine 2020; Kappelman et al., 2020). In Africa this statistic means nothing as CIOs from the continent are not featured in this research. CIO roles are content and context (organization and environment) specific, varying over time and industry, and are crucial for the success of an organization (Jones et al., 2020; Drechsler, 2020). AI, machine language, cybersecurity, and internet of things creates many opportunities and challenges to CIOs, thereby making this position arguably one of the most demanding and challenging in an organization (Gerth & Peppard, 2014; Kappelman et al., 2020). CIOs need a wide range of competencies to meet these challenges. CIOs are theoretically supposed to lead the IT strategy of organizations.

The CIO's role is subject to continuous evolution, as noted by Hafke et al. (2016); and this is informed by the constantly changing business environment.

Hypothesis 4: IT strategy and Enterprise expectations

We hypothesize that IT strategy positively influences enterprise expectations. The IT strategy and its purposeful deployment will ensure that organization achieve their expectation. The overall goal of meeting the expectation of customers and generating business value drives organization strategy and IT strategy should be an integral party of the whole organization strategy. Contemporary businesses and the disruptive technologies of social media platforms require that the IT strategy is up and doing. By integrating IT into businesses organizations are able to reach many customers globally (Wank et al., 2021). Internal department efficiency is also enhanced by the use of IT to create the connectivity that requires that the database management system can share information seamlessly to improve decision making that drives enterprise expectations (Atobishi et al., 2024). According Singh et al. (2024), the use of AI may enhance organizational effectiveness. Recent advances in artificial intelligence have been impressive (Mariani et al., 2023). It is possible to view GenAI as an exceptionally flexible subset of AI (Macdonald et al., 2023; Wank et al., 2021). In the event of new issues, GenAI can offer creative answers to challenging situations that effectively deals with organization expectations. IT strategy now integrates AI tools like GenAI, whose integration has been identified as a crucial component of businesses' technological transformation initiatives to attain efficiency and innovation (Mariani & Dwivedi, 2024).

Hypothesis 5: H5 explores the moderating role IT disconnect has on the relationship between IT strategy and enterprise expectations

IT disconnect has potential to derail all the benefits that AI, machine language, and cyber security in an organization may have in regard to the expected outcomes. IT disconnect has dimensions that greatly affect performance. These dimensions include, but are not limited to, limited connectivity, disruptive IT technologies, IT non alignment, and digital inequality (Helsper, 2021; Müller, 2020; Hesselberth, 2018; McChesney, 2018). Furthermore, the relationship between AI and organizational performance was made more complex in a few studies by the moderating influence of environmental dynamism (Dubey et al., 2020). The speed and volatility of the external business environment are reflected in environmental dynamism. AI, which is part of contemporary IT strategy's ability to adapt, becomes critical in enterprise environments. A useful IT strategy which uses AI, ML, data analytics and cyber security tools can improve performance of organizations.

Organizations operating in such contexts face both opportunities and challenges; and IT disconnect can distort the gains presented by the IT strategy. Organizations can prosper in the face of uncertainty thanks to GenAI's capacity to process real-time data, spot trends, and modify plans as necessary. To stay in line with changing external conditions, AI applications must be continuously evaluated and adjusted due to the dynamic context of business environments.

Results and Discussion

Theme 1: Organization strategy and Chief Information Officer (CIO)

Interviewees gave examples of how their companies initiated the adoption of strategies by setting ambitious sustainability goals, like employing the right person with the competencies to lead their organization's functional areas, to improve efficiency. By fostering an organizational culture that prioritizes sustainability and innovation, such visionary leadership ultimately improves the efficacy of digital transformation initiatives (Zheng et al., 2024). As a result, enterprises looking to incorporate sustainability into their operational frameworks may find that cultivating digital leadership is a strategic priority. As digital leadership and organization strategy improves competitiveness and guarantees long-term sustainability in the quickly changing business environment of today, organizations need to adopt digital leadership (Du et al., 2023, Offei and Toku, 2023). As a strategic enabler, digital leadership integrates cutting-edge technologies into business operations to promote socially and environmentally responsible practices and increase efficiency (Ávila-Robinson et al., 2022); and this is supported by the theory diffusion of innovation. Hence, the importance of adopting these attributes that are crucial for AI adoption. The majority of IT service management frameworks are based on the Information Technology Infrastructure Library (ITIL). It offers a consistent approach to IT service management (ITSM), providing instructions, best practices, and procedural guidelines for aligning IT services with organizational objectives. Organizations may use ITIL to boost operational efficiency, reduce costs, and increase customer satisfaction.

Theme 2: Organization strategy and IT strategy

The significance of cultivating a collaborative culture that promotes knowledge sharing and innovation was another important finding. Successful digital leaders actively foster work cultures where staff members are encouraged to share their thoughts on green innovations. Since departmental collaboration allows organizations to leverage diverse expertise and perspectives, many interviewees emphasized the importance of cross-functional teams in advancing sustainability initiatives. By putting in place organized knowledge-sharing procedures like workshops and innovation hubs, which encourage staff members to share their perspectives and experiences about sustainable practices, leaders help to foster this collaboration. As staff members become more involved in the digital transformation process, this collaborative culture not only increases the organization's capacity for innovation but also aids in overcoming resistance to change. It is crucial to be able to exchange best practices and knowledge. These hypotheses and themes are supported by dynamic capabilities theory, which emphasizes an organization's ability to recognize, seize, and transform opportunities in response to environmental shifts. This complements OLT and helps to further solidify the role of digital leadership in sustainable business transformation. This theme and hypotheses 2 are theoretically enforced by the Theory of Diffusion of Innovation, hence it is important to understand these attributes that are crucial for AI adoption.

Furthermore, this theory extends its applicability to the study's core analysis of explorative and exploitative innovation (Enkel et al., 2017).

Theme 3: CIO and IT strategy

The Theory of transformational leadership can serve as the foundation for creating an atmosphere of trust, creativity, and dedication to a common goal, transformational leaders can inspire and motivate their followers to achieve extraordinary results. Leaders who adopt digital transformation are more likely to act in ways that supports their organization (Zheng et al., 2024). By providing the leadership that ensures communication, fostering teamwork, and enabling staff members to take the initiative to seek out creative solutions that benefit the company and the environment, they achieve this. Studies have indicated that transformational leaders are essential in influencing organizational culture in a way that facilitates the adoption of sustainable practices. The transformational leadership theory posits that leaders can effectively mobilize their teams to implement innovative technologies by prioritizing sustainability and actively promoting value by meeting enterprise expectations. This claim is supported by research that shows that enterprises with visionary leaders who support digital transformation are more likely to embrace sustainable innovations as an IT strategy. Accordingly, this hypothesis highlights the critical role

that leadership plays in IT strategy indicating that successful digital leaders play a key role in coordinating technological advancements for improve enterprise expectation. As a result, companies looking to improve their fortune in a sustainable way into their operational frameworks may find that cultivating digital leadership is a strategic priority. Using data analytics, AI, ML, well-defined sustainability goals, and strategic investments and technological advancements, effective digital leaders propel business transformation (Del Soldato & Massari, 2024). CIOs create resource-efficient, ecologically conscious business models by leveraging cutting-edge technologies like blockchain, artificial intelligence (AI), and the Internet of Things (IoT) (Ávila-Robinson et al., 2022). These leaders create an organizational culture that encourages ongoing learning, creativity, and adaptive innovation by integrating digital solutions into sustainability IT strategies (Cai et al., 2024; Naqshbandi et al., 2023).

Theme 4: IT strategy and Enterprise expectations

A key component of a successful digital transformation has been identified as the alignment of sustainability strategies with technology. According to the interviewees, businesses that successfully incorporate digital innovations into their operational framework enjoy increased productivity and a competitive edge. One case study, for example, described how a manufacturing company used smart technology to track energy usage and cut waste, which significantly reduced costs and their environmental impact. This example demonstrates the observable advantages that occur when businesses carefully match their technology expenditures with sustainability goals. Additionally, CIOs who actively support technology initiatives have the power to shape the organization's strategic outlook, guaranteeing that sustainability continues to be a top priority in the digital transformation process (Benitez et al., 2022). This alignment benefits the organization in addition to driving operational improvements and ultimately meeting enterprise expectations.

Theme 5: IT disconnect moderates the relationship between IT strategy and enterprise expectations

The moderating role of IT disconnect, which actively use technology in a negative way, fosters a culture of risk-taking, and affects the IT strategy in enterprise expectations (Zhu et al., 2024). Based on the Diffusion of Innovation Theory, IT is supposed to create innovativeness (Liu et al., 2024), however it can have negative consequences when not applied in the right way. An IT strategy creates the needed cross-functional cooperation among departments to deliver knowledge-sharing projects and organized innovation programs, which are greatly aided by this leadership style (Truong et al., 2024). In addition to supporting digital leadership practices, senior executives who place a high priority on innovation foster an organizational environment that speeds up the adoption of an IT strategy that guarantees that sustainability principles are methodically incorporated into the overall business strategy (Hyder et al., 2023).

Managerial implication, limitation, conclusion and future research

CIOs' responsibility to manage change is being accelerated by waves of digital advancements as part of an IT strategy that ensures that IT disconnect does not adversely affect the expectation of businesses. Management, as part of the organizational strategy, should employ CIOs who are competent change agents in order to be relevant and productive in their leadership positions in the African context. However, the IS literature has mostly overlooked the issue of whether these change agents can be just as effective in Africa. This study sought to close this gap and produce a framework that can be used to deal with hiring of competent CIOs who will ensure that they invest in an IT strategy that will improve the businesses expectations and not IT that disconnects in a way that will adversely affect the enterprise. Using the theories of diffusion of innovation, dynamic capabilities and transformational leadership managers of organizations will appreciate this paper as an extension in the IS and management literature. The conceptual model in this paper presents a management model that includes CIOs, IT strategy, organisation strategy and organizational expectation ensuring that IT disconnect does not adversely influence organizational expectations negatively.

This research is qualitative and therefore very subjective to the interpretation of the researcher biases, so a quantitative study can be conducted to validate the conceptual framework. Future empirical evidence

can be obtained from studies in a different context. IT's potential to transform organization outlook positively cannot be overemphasize, however the same IT can create a disconnect that will adversely the expectation of organization.

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Sustainability at Mahakumbh 2025: Lessons on local waste management from the world's largest mass gathering in India

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Keywords

Corporate Social Responsibility, Local waste management, Large scale, Mahakumbh 2025, Strategies, Sustainability.

Abstract

After the 2018 ban by China on the import of foreign waste, the responsibility of waste processing has fallen back on governments and companies, leading to a shift from global outsourcing of waste to managing waste locally. The waste management approaches adopted at Mahakumbh 2025, the world's largest spiritual fair held for forty-five days in India, can offer lessons on how domestic waste can be managed locally. The fair witnessed an unprecedented congregation of people, presenting critical challenges for sustainable waste management. It reportedly witnessed over 663 million people worldwide participate in the events, celebrations and meditations held on the banks of the Ganga River. For this purpose, a temporary "city" was set up on the riverbanks for nearly one and a half months, with housing facilities, hospitals, restaurants, eateries, transportation, business activities and hundreds of events. One of the biggest tasks in this unique gathering was to maintain the cleanliness and hygiene in the fairgrounds where millions of devotees and tourists arrived, stayed, lived and celebrated. Field visits, attendee reports, wide media coverage and news reports show that the area was mostly very clean despite the gatherings and events happening daily on such a large scale, from morning till night. This is a pioneer study that explores the waste management strategies and practices for managing the huge amount of solid waste generated at the Mahakumbh. Using an exploratory and inductive approach, the findings suggest that adopting a decentralized approach, providing more dignity and better wages for waste management work, hiring manpower, use of technology and multistakeholder collaboration helped manage the gigantic amount of domestic waste locally. The model of Mahakumbh 2025 can also offer valuable guidance to address waste management issues in large scale gatherings worldwide, from the Rio Carnival in Brazil to The Glastonbury Festival in the UK.

Introduction

With increasing economic development and rising consumption, waste management is one of the key sustainability challenges faced globally (World Economic Forum, 2025). Because waste management that is effective and sustainable in the long term often entails higher costs for companies and governments, many developed countries in the past exported their waste to developing countries such as China, where less stringent frameworks and laws were in place. It is estimated that profits from the illegal waste trade amount to US\$ 10–12 billion annually (Basel Institute on Governance, 2021; Tan et al., 2018). Around 2018, China which was a major importer of solid waste from developed countries, imposed a ban on foreign waste imports. This led to major changes in global waste flows with many developed countries searching for other developing countries in which to dispose of their solid waste. A better response to such bans and disruptions can be to find strategies and realistic ways to manage the domestically generated waste locally.

The recently concluded Mahakumbh 2025 fair in India witnessed waste generation on a humungous scale. But as per multiple independent sources and attendees, the sprawling area was very clean and the solid waste was managed quite well. Therefore, a study could offer interesting insights about local waste management that actually works. Given the sensitivity of the Ganga ecosystem and increasing global focus on sustainable development, Mahakumbh 2025 was positioned by the Indian government as a model for green event management. This paper analyzes the waste management strategies and practices employed during the event.

Mahakumbh 2025

The “Mahakumbh 2025” was the largest public gathering on spirituality and faith held at the city of Prayagraj, India between 3-Jan-2025 to 26-Feb-2025. This unique fair and festival is commonly called “mela” in Hindi language. It occurs once every 144 years in Prayagraj at the “Triveni Sangam” - the meeting point where the Ganga, Yamuna, and the mythical Saraswati rivers converge. The timing of this festival is determined by the astrological positions of the Sun, Moon, and Jupiter, believed to signal an auspicious period for spiritual cleansing and self-enlightenment (Government of India Research Unit, 2025). Unlike traditional religious gatherings, here people visited for both spirituality and celebration. UNESCO recognized Kumbh Mela as a “Cultural heritage of humanity” and the world’s largest peaceful gathering of pilgrims (Central Pollution Control Board, 2019). Devotees, pilgrims and spiritual seekers from nooks and corners of India and worldwide gathered to participate in various spiritual and cultural celebrations. On each day of the Mahakumbh festival, thousands of devotees gather at the “Sangam”, the confluence of the Ganga, Yamuna, and Saraswati rivers, to take a holy dip in the sacred river. The Mahakumbh 2025 edition reportedly witnessed over 663 million devotees take a holy dip in the period from 1 January 2025 to 6 February 2025 (Biswajeet Banerjee, 2025).

A temporary ‘tent’ city spanning 4,000 hectares, housing 150,000 tents, was set up for nearly one and a half months. It included stay facilities, hospitals, restaurants, eateries, transportation, markets, business activities, daily public talks, events, and celebrations. The event attracted approximately 660 million visitors, and witnessed a notable rise in international tourists from the United States, United Kingdom, Canada, Australia, Russia, and Japan (AG Horizon, 2025; Behal, 2025). Figure 1 below shows the tent city at night. Figure 2 provides a glimpse of the gathering on one of the bathing days at the Mahakumbh 2025.



Figure 1. Gatherings at one of the bathing days at Mahakumbh 2025 (Source: Department of Revenue, 2025).

The Mahakumbh was held after 144 years based on celestial and spiritual factors. Due to the high spiritual significance of the event, nearly 15 million devotees congregated daily (Vinod Rai, 2025). In nearly 45 days, a temporary city was set up to provide stay facilities for pilgrims along with electricity,

water and sanitation facilities, hospitals, restaurants, eateries and transportation. The temporary city featured daily markets, numerous business activities, public talks, cultural and spiritual events and celebrations. Unlike other mass gatherings around the world, where people usually stay for only a few days, tourists and spiritual seekers at the Mahakumbh often stayed for nearly a month. Around 50,000 security personnel were deployed to ensure safety and management at the gathering.



Figure 2. Partial view of the tent city at night (Source: Ministry of Information and Broadcasting, 2025).

When a temporary “city” comes up on the riverbanks, with stay houses, hospitals, restaurants, cafes, transportation, markets and business activities and events, it creates large-scale logistical and management complexities. One of the biggest tasks for the authorities was to maintain cleanliness and hygiene in the area where millions of devotees and tourists traveled, stayed, lived, and celebrated within the limited mela grounds for nearly 45 days. The challenge was not only the waste generated on the riverbanks but also the flowers, offerings, plastics, and other non-biodegradable items thrown into the river during religious practices. It is reported that the actual number of visitors surpassed the government’s expected figures. If we compare the event with other mass gatherings in the world, such as concerts and pilgrimages, the Mahakumbh 2025 was much larger in scale, lasted longer in duration, and involved multiple events per day. For example, the Hajj in Saudi Arabia lasts five days, and on peak days nearly 2–3 million pilgrims attend. Other major events, such as large concerts and celebrations, usually last only a single day or a few days and attract a few million people (Wikipedia, 2025).

Previous edition of Mahakumbh

News headlines highlighted how some of the previous editions of the Kumbh and Ardhkumbh melas (in 2013 and 2019) had left behind heaps of waste and an even more polluted river, drawing strong criticism from the National Green Tribunal (NGT). Latest detailed case study by (Dubey et al., 2025) evaluates the current procedures for managing municipal solid waste (MSW) in Prayagraj city and finds

that a considerable amount of waste continues to go uncollected or improperly disposed of. Given this setting, the broad research questions are as below:

1. What were the waste management strategies and practices adopted at the largest mass gathering in the world, held for nearly one and half months?
2. How was domestic waste managed locally, especially how waste management strategies were effectively implemented in such an unprecedented large scale gathering?

The broad objective of this study is to explore the waste management strategies and practices at the Mahakumbh 2025, held in Prayagraj. This was the largest mass gathering in the world that was not just for a day or a few days but forty-five days.

Methodology

An exploratory, inductive, and interpretive approach was adopted using secondary data such as government reports, media coverage, environmental monitoring reports, social media (videos and vlogs by attendees). Additionally, the author visited the Mahakumbh and carried out field observations during February 2025.

Waste generated

Based on multiple reports, approximately 400–600 MT of solid waste was generated daily, consisting of religious offerings such as flowers, garlands, coconuts, cloth, and food items — especially at the bathing steps along the riverbanks. The waste also included large amounts of paper, plastic wrappers, food packaging from stalls and pilgrims, and other plastic materials (Hindustan Times, 2025). As reported by the Urban Development Department, approximately 400 metric tonnes (MT) of solid waste was collected and disposed of daily (Hindustan Times, 2025).

A field study by R. Singh et al. (2025) found that the massive amount of solid waste at the mela was generated as a result of the daily attendance of approximately 1.5 million visitors. On days considered holy to take a dip in the river, known as ‘Maha Snan’ days, there was a surge in pilgrims and visitors. For example, on the peak dates of January 13 and 14, 2025, the Sangam area experienced an extraordinary influx of around 50 million devotees from across the globe. Consequently, nearly 16 million litres of faecal sludge and 240 million litres of greywater were generated daily (Vinod Rai, 2025).

Despite such an unprecedented amount of waste generated, the author's field visits on five separate days of the fair and attendee reports from the grounds suggest that waste management was executed quite effectively, with most of the fair ground area appearing clean and hygienic, even during peak days. Table 1 below demonstrates the indicators and targets on waste management at Mahakumbh 2025.

Indicator	Target	Achieved	Remarks
Waste Segregation at Source	60%	65%	Target exceeded
Landfill Waste Reduction (vs. 2019)	20%	22%	Target exceeded
Vendor Compliance (eco-friendly norms)	85%	90%	Strong enforcement and awareness campaigns worked
Resolution Time for Sanitation Complaints	<2 hours	~1.3 hours	Real-time monitoring system proved effective
Ganga River Water Quality Improvement	15%	18%	Improvement above target

Table 1: Key Performance Indicators (KPIs) for Waste Management at Mahakumbh 2025. *Source:* Author compiled data from multiple sources (Government of India Research Unit, 2025; Kapoor, 2025; Ministry of Tourism, 2024; Vinod Rai, 2025)

Strategies and initiatives adopted

Decentralized Waste Management

To handle massive waste volumes efficiently across the sprawling Mahakumbh area, it was divided into 25 sectors spread over the 4,000-hectare of the river banks and each sector was managed semi-independently (Diwan, 2023). Each sector was designed to accommodate pilgrims with housing, roads, electricity, water supply, and communication towers (S. Singh, 2025). A total of 25,000 dustbins, along with 3.7–3.8 million garbage liners, were installed at nearly 25-meter intervals, ensuring ample coverage and localized waste drop-off points. One waste transfer station was set up in each sector and supported by two waste compactors. Every sector had two circle in-charges, 11 supervisors, and mates, with each mate overseeing multiple groups of 12 street-cleaning workers (Kapoor, 2025).

Temporary units of Material Recovery Facilities (MRFs) were established for waste sorting and recycling, and sector-level composting units were built for biodegradable waste management. Three temporary sewage treatment plants were also set up. A study by (IFC, 2024) states that temporary infrastructure, such as modular sewage treatment plants (STPs) and fixed sewage treatment plants (FSTPs) were planned to be dismantled and reused in rural areas post-event. Such temporary STPs & FSTPs reduce land use by 70% and eliminate the need for chemical treatment.

Source Segregation and Collection

Waste segregation at the source was another important strategy adopted to prevent waste from piling up in the area. According to officials, 25,000 color-coded bins were installed—green for biodegradable waste, blue for recyclables, and black for non-recyclables—to facilitate segregation. Dustbins with liner bags were placed systematically and in ample quantities across different sectors. A total of 3.775 million liner bags were provided to the cleanliness and sanitation teams for segregation, collection, and disposal (ChangeStarted, 2025; Press Information Bureau, 2025). Authorities also installed bio-toilets throughout the mela area, while waste bins were placed inside tents and public spaces to encourage proper disposal (Department Of Revenue, 2025). Special sanitation teams were deployed for rapid waste clearance, particularly after major bathing rituals (Press Information Bureau, 2025). To manage bio-waste and maintain hygiene standards, bio-vans were deployed to collect bio-waste from the entire area every 10–15 days (Department Of Revenue, 2025). Reverse Vending Machines (RVMs) were also placed at different locations to effectively manage plastic waste (KnowESG, 2025).

The Mahakumbh 2025 also introduced a campaign discouraging the use of plastics and thermocol in the mela area. A large-scale initiative involving thousands of volunteers raised awareness about using biodegradable cutlery—plates, bowls, and cups—commonly known in Hindi as *pattals*, *dona*, and *kulhads* (The Financial Express, 2025). These biodegradable materials have been traditionally used in India since ancient times. Strict regulations on single-use plastics were also enforced to prevent commercial outlets from generating such waste. Special awareness drives on waste segregation and disposal into bins were conducted through multimedia campaigns using hoardings, radio, and mobile alerts, which were further translated into several languages such as Hindi, English, and various regional languages.

As per government statistics, on major bathing days such as February 14 and February 24, 2025, over 20 million tourists participated in the mela. Quick Response Teams (QRTs) were deployed to ensure swift removal of waste, particularly on such days. There were also overnight cleaning drives to restore the riverbanks and fairgrounds. Cleaning vehicles included 120 hopper and GPS enabled tipper trucks and 40 compactors for efficient garbage collection, along with 94 suction machines for liquid waste management (Vinod Rai, 2025). The trucks collected waste three to four times daily, with additional trips on peak event days. A large team of cleanliness workers known as *Swachhata Mitras* were deployed to monitor sanitation hotspots, ensuring that garbage bins were used properly, and that waste was segregated at the source. Two trash skimmers were also used to remove 10–15 tonnes of waste from the river daily.

Redefining the status, Utilizing manpower

Cleanliness workers are often looked down upon in India. They are paid some of the lowest wages and historically, socio-cultural factors have led to notion that waste collection and cleaning are not

respectable forms of work. As a result, even many economically disadvantaged people hesitate to take up such jobs. To address this bias during the Mahakumbh preparations and execution, cleanliness workers were referred to as *Swachhata Mitras* and *Ganga Sewa Doots* (Gupta, 2025). The term *Ganga Sewa Doots* translates to 'Ambassadors of the Ganga' in English. This helped shift perceptions among workers themselves, officials, and the public regarding the dignity of their work. Reports indicate that around 2500 *Ganga Sewa Doots* were hired to keep the river banks clean. A study by Kapoor (2025) notes that nearly 15000 street cleaners were hired (5000 by private sector and 10000 by the government) and organized into 800 groups with nearly 12 cleaners per group for faster waste removal in different sectors of the fairground. They played an instrumental role in ensuring the success of the multiple waste management initiatives adopted. *Swachhata Mitras* were deployed to monitor sanitation hotspots, ensuring that garbage bins were used properly, and that waste was segregated at the source. They were trained to handle waste management processes efficiently, using special gloves, masks, and other safety equipment to maintain hygiene. Figure 3 below shows the cleaning workers collecting garbage from the riverbanks.



Figure 3. Swachhata Mitras cleaning the river banks during the bathing days at Mahakumbh 2025 (Source: (Parvez Sultan, 2025))

Coca cola India, under the "Maidaan saaf" campaign distributed 21,500 jackets made from recycled plastics (Anjali Singh, 2025). Maidaan Saaf campaign was inspired by the opportunity to promote effective waste management at large-scale gatherings across the country. These jackets were given to sanitation workers, boatmen, and volunteers working round the clock to ensure the safety and well-being of visitors.

The *Ganga Sewa Doots* focused on educating the pilgrims about the importance of keeping the Ganga River clean. They conducted awareness campaigns, distributed biodegradable bags, and encouraged people to avoid littering, especially in and around the sacred river. These volunteers also facilitated the distribution of eco-friendly alternatives to single-use plastics, thereby promoting sustainable practices. Serving as role models and change agents, their grassroots engagement played a vital role in the implementation.

Due to socio-cultural factors, the well-being of sanitation and cleanliness workers in India is often neglected, which commonly leads to inefficiencies in waste management. But this time, the state government prioritized the well-being of sanitation workers and designated them as "Safai Mitras"

(translates into English as ‘friends who help clean’), recognizing their crucial role in maintaining cleanliness at Maha Kumbh and making the “Swachh Maha Kumbh Abhiyan” a huge success. New measures were adopted such as building sanitation colonies to provide proper housing and amenities, admission to primary schools for their children, ensuring access to education, uniforms and mid-day meals, through the “Vidya Kumbh” initiative. Fair management authorities in each sector were responsible for providing adequate food, accommodation, and timely salary payments for all sanitation workers. The government also supplied food rations to each worker (Kapoor, 2025). These efforts highlight the administration’s commitment not only to maintaining sanitation but also to supporting the workers responsible for it (Press Information Bureau, 2025).

Technological Integration

Waste disposal is a monumental task in such gigantic-scale gatherings and was managed through an integrated IT system that monitored and controlled the waste disposal rate in each sector of the mela. The use of advanced information and communication technologies (ICTs) by the government and local administrative agencies enabled real-time monitoring of the fair for forty-five days. Geographic Information Systems (GIS) were employed to create detailed maps of the festival grounds. GIS-enabled dashboards tracked waste collection frequency, dustbin fill levels, and disposal routes (Tourism, 2025).

A new app called the “Swachh Kumbh” app enabled pilgrims to report sanitation issues and locate nearby toilets or waste bins simply through their smartphones. The app was usable in multiple local Indian languages, considering the diverse backgrounds of tourists.

Artificial intelligence (AI) equipped special vans designed to detect uncleared trash piles on the roadsides and peak gathering spots in the fairgrounds (TNN, 2024). Upon detecting a waste pile, the AI van would generate an event ticket for the control room and send alerts to sanitation workers assigned to the concerned mela sector.

Trash skimmer machines were deployed to remove 10 to 15 tons of garbage from the Ganga-Yamuna daily (India, 2025). The trash skimmers collect floating waste from the water’s surface and have been increasingly used worldwide for cleaning rivers, ports, and seas. These machines can remove plastic, bottles, religious offerings, clothes, metal objects, puja waste, and even dead animals or birds. The machines are also effective in removing water hyacinth and aquatic weeds, ensuring clean and navigable waterways. The machines used in the Mahakumbh fair had a capacity of 13 cubic meters and covered a 4 km stretch of the river. A typical trash skimmer features gates on both sides, with a conveyor belt positioned inside. These gates close hydraulically to trap floating debris. Once collected, the waste gets transferred to the conveyor belt. The debris is then moved to an unloading conveyor belt, where it is extracted and processed for disposal (India, 2025; YouTube, 2025). Innovative wastewater treatment technologies such as the Hybrid Granular Sequencing Batch Reactor (HGSBR) - an advanced biological treatment method, developed by ISRO and BARC - were used to process faecal sludge and greywater effectively. Geotube Technology, a cost-effective and efficient method for dewatering sludge, played a significant role in managing liquid waste.

Waste to Resource Approach

While large scale waste collection and awareness drives were necessary, a bigger concern was where to finally dispose of the massive amount of waste that had been collected. Several techniques and methods were used to convert the collected waste into a resource. The first method was composting, in which organic waste generated on-site was processed and later used for landscaping. Religious offerings were treated separately through vermicomposting.

Another method was recycling and the collected plastic, metals, and paper were sold to authorized recyclers. The authorities implemented a comprehensive waste management system capable of processing 650 metric tonnes of garbage per day at the Baswar waste processing plant, located on the outskirts of Prayagraj (Vinod Rai, 2025). Evidently, 21,500 jackets made from recycled plastic were distributed to sanitation workers and volunteers, in collaboration with Coca-Cola India. Also, 1,000 changing rooms from recycled plastic were installed along a 12 km stretch of the Ganges (AG Horizon, 2025).

Multi-stakeholder Collaboration

Government allocated Rs. 152.37 crore (~US\$ 17 million) for special cleanliness management measures (Gupta, 2025). Sanitation workers worked around the clock to ensure the entire region remains clean for devotees, coming to Prayagraj to attend the Maha Kumbh. (India, 2025). As per a January 2025 article (The Financial Express, 2025), nearly 10,000 cleaning staff, respectfully addressed as “Safai Karamcharis”, were deployed. These were further divided into 850 teams. Over 15,000 sanitation workers, were mobilized, trained in best practices by NGOs and PMC trainers and equipped with personal protective equipment. Special sanitation teams were deployed for rapid waste clearance, particularly after major bathing rituals.

Volunteers led important initiatives that improved large-scale waste management. One such initiative was called the “One bag one thali drive” (The Financial Express, 2025) to make the gathering a low-waste generator. Under this initiative, 1.5 million steel plates (reusable) and 2 million cloth bags were distributed among devotees. Over 50,000 volunteers participated in multiple waste management efforts. Unlike normal days, a higher level of community participation was observed. Workshops were conducted for school children in the city to sensitize them regarding the non-use of plastic. NGOs conducted awareness and behavioural change programs during the initial few days in the fairgrounds.

Private sector initiatives to manage waste were launched by the Tata group, Reliance Industries, Coca-Cola, Unilever, PepsiCo. as studied by Gupta (2025). For example, FMCG brand Reckitt, through its flagship hygiene brand Dettol supported nearly 15,000 sanitation workers by providing training programs and making washing soaps accessible to them at Kumbh. UltraTech Cement Limited specifically processed 400 MT of plastic waste as an alternative fuel (UltraTech, 2025). It can be understood that the government and corporations aligned with SDG 12 of responsible production and consumption in the context of waste management.

Discussion and Conclusion

In the post China ban era, when solid waste is no longer freely tradable, localized waste management has become even more important for governments and corporations. In this respect, the waste management strategies and practices at the Mahakumbh 2025 event offer valuable insights into how large-scale domestic waste can be managed locally, responsibly, and efficiently.

Globally, numerous waste management strategies and practices have been adopted over the years, to handle solid waste. Many developed countries often chose to export the solid waste to developing countries where the costs of waste management were lower. Both developing and developed countries have been trying circular economy models, corporate social responsibility (CSR) measures, regulations such as penalties for not segregating waste and stressed the use of biodegradable materials. However, it is evident that despite such measures, many countries still grapple with improper waste disposal, waste heaps and landfills. Particularly, after large scale mass gatherings such as concerts, sports events, rallies, religious festivals etc., the local authorities have to deal with mounting waste and litter. One recent example reported by (Shirreff, 2024) is from the Glastonbury festival - the world’s largest music festival in the UK where despite environment-friendly messaging, the area was strewn with litter and overflowing litter bins.

While there have been previous editions of spiritual fairs in India that saw similar waste management challenges for authorities, the Mahakumbh 2025 which was way larger on scale, stands out with its unique combination of strategies and approaches that successfully addressed the challenges of large scale domestic solid waste. The study highlights how the decentralization of waste management by dividing the entire fairgrounds into multiple sectors and then managing them semi-independently played a crucial role in more effective waste collection and disposal. Independent teams for waste collection and disposal in each sector allowed for timely execution of responsibilities and quicker waste removal.

An important step taken up by the government was redefining the way cleanliness and sanitation workers were supported and perceived. By providing better facilities, timely and improved wages to workers, and redefining their status as friends of cleanliness and ambassadors of the holy river, a new dignity was brought into this line of work that many in India previously refused to take up. This not only led to a lot of new job creation but also improved the societal perceptions of such work. Technology tools

further improved the efficiencies of tracking and collection and added more dignity to the job. This indicates that sustainable waste management strategies can be successfully implemented in developing countries if the workforce is allowed better pay, proper tools and more dignity. The waste management sector has a huge potential for new job creation.

The role of multinational corporations such as Unilever, Coca-Cola, and Reckitt Benckiser contributed significantly to waste management through manpower, donations and recycling support. The participation of such corporations represents how CSR helps address cross-border local sustainability challenges. The Mahakumbh festival highlights the evolving role of global businesses in addressing waste management concerns through localized action.

Lastly, a multi-stakeholder collaboration worked well to solve multifaceted issues of waste management in a fair that was of both spiritual and tourism significance. A UN study by (Henrique Pacini, 2021) stressed that for successful circular economy, stakeholders from global to local levels must work cohesively to translate plans into action. This was illustrated in the Mahakumbh where the central and local government agencies, corporations, NGOs, independent volunteers and technology came together to achieve a seemingly impossible goal of clean and environment-friendly Maha Kumbh festival.

This study throws light on how large scale waste was managed effectively and locally at the Mahakumbh 2025. If this model can be adapted in other cities, countries or large scale gatherings worldwide, it can not only help manage the domestic waste but also create new jobs, foster corporate social responsibility and reduce the dependencies of exporting waste.

Limitations and Directions for Future research

While this study explores the waste management strategies and practices at the world's largest gathering, there is a need to conduct more in-depth studies how waste was managed by different sector level teams. Such studies can further strengthen our understanding of what actually worked that led to successful implementation of the local waste management strategies. Further research could also examine the recycling of collected waste and how individual corporations benefitted from such recycling initiatives. In addition, future studies could conduct detailed surveys with foreign nationals regarding their experiences of waste management and cleanliness at the fair, to gather more realistic and comprehensive data about the event.

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Incorporating strategy and business model into HR planning: A systemic design approach

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Keywords

business model, human resources, strategy, systemic design

Abstract

Purpose. The purpose of this paper is to present a theoretical argument for the use of systemic design methodology (SDM) in human resources planning, to establish value that is rare and difficult for competitors to imitate.

Methodology. The authors reviewed relevant literature on HR planning, strategy, business model, and SDM.

Findings. Based upon this review, the authors propose that HR planning can incorporate competitive strategy and business model in a rare, valuable and inimitable way, by using SDM.

Originality. This study merges two theories: the Resource-Based View (RBV) of the Firm and Systemic Design Theory, in order to create unique HR solutions that have lasting value.

Study implications. Propositions suggest that HR Planning can provide more unique value by using SDM, which satisfies all requirements of RBV.

Introduction.

Since the 1980's, human resources (HR) practitioners and scholars have argued that HR practices should be arranged to help organizations achieve performance goals and business outcomes (Buller and McEvoy, 2012; Schuler and Jackson, 1987). This argument is rooted in the concept of the resource-based view (RBV) of the firm espoused by Jay Barney (1991). RBV posits that a resource will be valuable to a firm, to the extent that the resource is rare, valuable, and difficult to imitate. Because a high performing workforce is rare and consists of socially complex resources such as trust, culture, and teamwork, HR practices are argued to fit Barney's description (Colquitt, Lepine, and Wesson, 2023). HR practices include areas such as recruiting, training, compensation, benefits, employee engagement, performance management, diversity and inclusion, and organizational design.

Together, these practices comprise the HR plan, which "outlines an organization's approach to managing its human resources to meet current and future business objectives" (Dessler, 2012). HR effectiveness is achieved when the planning process integrates appropriate HR practices that align with business goals and maintain internal consistency. HR effectiveness has been measured as the strength of the relationship between the HR plan on the one hand, and organizational efficiency and revenue growth on the other (Becker and Gerhart, 1996).

Rooted in RBV, scholars have posited that HR effectiveness will be greater when practices are aligned to support specific business strategies (Buller and McEvoy, 2012; Schuler and Jackson, 1987, Takeuchi, 2009). Strategy has typically been construed as the way the firm distinguishes itself from its competition, as outlined by Michael Porter (1986). This consists of strategic types such as cost leadership, differentiation, and focus. Cost leadership focuses on providing a product or service at the lowest price in one's industry; differentiation consists of providing innovative products and services that stand out for consumers, justifying a higher price. The focus strategy is centered around a niche market, such as a particular region, segment, or customer base. The focus strategy may be combined with the first two; for example, a tool manufacturer may build tools that are both highly innovative and focused on a particular client base, such as commercial construction companies.

Aligned to one or more of these strategic types, HR practices shape the direction, persistence and intensity of employee motivation and effort (Colquitt et al. 2023). For example, American Express (AMEX)

uses a differentiation strategy which emphasizes exceptional customer service (Pulliam, 2025). This strategy requires AMEX to pay customer service representatives highly compared to the market, and to invest in training that focuses specifically on enhanced customer service. This, in turn, attracts a higher-paying clientele, generating greater revenue.

While there has been a gradual increase in the use of HR practices to support strategy (Takeuchi, 2009), HR practitioners often perceive that their function is still too heavily focused on clerical and administrative tasks (Bailey, Yeoman, and Madden, Thompson, and Kerridge, 2019). The authors believe that this may be due to two factors: 1) lack of focus on business model in HR planning; and 2) lack of a comprehensive methodology for including strategy and business model into HR planning, in a way that is valuable, rare, and difficult to imitate. This will be explained further below.

While strategy influences which behaviors are needed to differentiate a firm from its competitors, this view is entirely external. AMEX's differentiation strategy alone does not translate directly to profitability. Rather, this strategy informs the business model, or how the firm translates the strategy into revenue generation and profitability (Casadesus-Masanell and Ricart, 2010). The HR practices must also support the business model. In this case, AMEX would also need to focus its HR practices on hiring, training and rewarding the best financial managers, who can generate models which enable AMEX to achieve sufficient profit margins. Focusing solely on competitive strategy would cause AMEX to neglect this step.

In addition, for certain organizations, such as not-for-profits, competitive strategy is not as salient as it is for highly innovative or cost-focused industries (Porter, 1986). For example, a community mental health agency might be the only provider in its region. It is not focused on beating the competition. However, it does need to meet business goals and manage its budget, in order to remain solvent and continue to receive client referrals from government agencies and social service organizations. In these cases, the business model would be more important.

Given the above arguments, there have been promising studies testing the relationship between strategic goals and HR practices (Schuler and Jackson, 1987; Takeuchi, 2009). These studies have found that when specific suites of practices were matched up with specific strategies, this resulted in higher firm performance. This work has provided a promising indication that business outcomes are higher when HR practices are aligned to the strategy. This establishes the "valuable" component of RBV.

However, to our knowledge, there has not been a comprehensive HR planning method provided to ensure that this value is rare, difficult to imitate, and difficult to substitute (Barney, 1991). Such a methodology is necessary to ensure that the HR system is unique in its market.

In this paper, we propose that systemic design methodology (SDM) provides an appropriate framework to accomplish this (Rosini and Barbero, 2021). SDM is a method for developing approaches to complex and dynamic problems. It includes key steps focused on discovery and diagnosis, framing and concept formation, planning, intervention and evaluation (Jones, 2014).

Literature Review.

Organizational theorists have argued that human resources practices can be configured to support specific business strategies (Buller and McEvoy, 2012; Schuler and Jackson, 1987). Barney (1991) defines human resources as "training, experience, judgment, intelligence, relationships and insights of individual managers and workers..." As such, human resources is well-suited to provide strategic advantage. This is because if managed properly, it provides a valuable, rare, and difficult-to-imitate resource. By "valuable," Barney argues that the resource must help the organization exploit an opportunity or defend against a threat. In the case of HR, this could include training a customer service team to support a target market of high-paying customers, resulting in increased revenue. By "rare," Barney notes that a firm gains competitive advantage by implementing value-creating strategies that other firms are not implementing. He cites "managerial talent," a human resources resource, as being rare. In this example, a firm's managerial team might have a unique skill set which encourages the development of innovative products. This firm's competitors lack that skill set.

Barney also argues that the resource must be "imperfectly imitable," or difficult to imitate. If other firms can easily replicate the resource, it will no longer be rare and valuable. Unlike physical resources such as machinery and technology, human resources are difficult to replicate, because "unique historical

conditions” help form them. One example is AMEX’s acquisition of Rooam (Muhn, 2024), a mobile payment platform focused on dining and restaurants. A unique condition had to occur, where an organization with the specific talent AMEX needed was available for purchase.

In addition, Barney notes that human resources establish inimitable value by fostering “socially complex” interpersonal relationships at work. For example, through culture initiatives and team building, HR shapes interpersonal relationships that foster unique ways to collaborate. Finally, Barney notes that the resource must not have easy-to-find substitutes (1991). In the case of technology, copycat apps become available each day, at lower and lower cost. However, Barney notes that a firm will be unable to copy another’s leadership team with any effectiveness.

The literature has also indicated that these HR practices need to be arranged in a complementary way (Buller and McEvoy, 2012). To support the strategy, practices must be mutually reinforcing and cannot be introduced in isolation. This argument is supported by the value chain concept advocated by Porter (1996), which posits that an organization will be better able to execute its strategy if it coordinates its internal activities focused on developing, producing, selling and delivering its products and services. Iruthayasamy (2021) describes several examples of this, such as the need for Southwest Airlines (cost leader) to implement various internal cost management practices, or the need for Apple (differentiator) to implement internal activities that support innovation and enhanced brand management. These internal activities include HRM practices (Buller and McEvoy, 2012).

In sum, HR scholars have cited RBV as the theoretical justification for aligning HR practices with strategy, and have noted that these practices must be mutually supportive. However, it does not appear that they have explained how this can be done in a way that is rare, inimitable, and difficult to substitute. Instead, HR practitioners are often focused on the opposite – how to adopt the latest trend or best practice in the field. This runs counter to RBV. Therefore, a gap remains in understanding how the strategic and business model views can be properly incorporated into HR planning (Jackson, Schuler, and Jiang, 2014).

Business models. It is likely that HR practices need to support the business model as well as the strategy. The business model describes how transactions are structured and governed in a way that generates revenue (Amit and Zott, 2001). It also includes how internal technologies are set up to support the transaction structure (Casadesus-Masanell and Ricart, 2010). Unlike the competitive strategy, which is externally facing, the business model is mostly internal.

There are many types of business models. Some common types include product-based models such as manufacturing and retail, service-based models such as consulting and software-as-a-service (SaaS), subscription models such as Netflix, and Freemium models such as Spotify (Andreini et al. 2021). An effective business model will go beyond describing the product or service. It also describes how it operates internally and what behaviors are needed from employees (Amit and Zott, 2001). For example, in e-commerce, business models may vary according to their focus on efficiency (such as with Amazon), complementarities (such as Apple’s bundling of hardware and software), Lock-in (such as subscription models), or novelty (such as NFT’s).

A successful business model requires employees to adapt, collaborate and engage in work process innovations (Andreini et al. 2021). It requires a specific set of knowledge, motivations and behaviors to be properly executed. Like the competitive strategy, the business model requires internal assets to be arranged in a complementary way to be successful. For these reasons, HR practices should be designed to support the business model as well as the strategy.

This argument is consistent with RBV because a firm’s business model enables the firm to “exploit opportunities and/or neutralize threats” (Barney, 1991). For example, one of the authors recently helped a local convenience store chain develop a supervisor training program. This firm uses a cost leadership strategy. To translate this strategy to profit, the firm controls most of its supply chain, from production to retail sales. This allows for better cost control and product consistency, which in turn enables the cost management strategy. The supervisor training program was necessary to ensure that managers overseeing the supply chain are enforcing these controls.

Another reason for focusing on business model is that in some organizations, the business model is more salient than the strategy. In some instances, an organization develops its business model before its strategy. An example provided by Teece (2010) is that of Gustavus Swift in the 1840’s, who proposed

slaughtering cattle in the Midwest United States, and then shipping the refrigerated meat to the east coast via railroad, instead of shipping live cattle. In this case, Swift had to first prove that the business model was financially viable, before attempting to differentiate his services from that of east coast butchers. Swift's business model required a strong focus on efficiency and logistics, innovative development of refrigeration methods, and public relations campaigns to convince customers that the new methods were safe and appealing. All these efforts had implications for the types of employees who were recruited, and how their skills were developed and employed.

This prominence of business model may also occur in startups or other organizations requiring innovation and change. In these cases, the firm is more focused on how to turn "payments into profits" (Teece, 2010) than on its competitive posture. In addition, certain industries may be more focused on business model than on strategy. This includes organizations such as educational institutions and social service agencies, health care and other not-for-profit organizations. These organizations may be the "only game in town," so distinguishing oneself from peers is not a significant focus. And yet, these organizations are all motivated to meet performance goals and execute a business model. For example, a university may not have significant competition in its region, but it must meet its business model to continue to receive the accreditation that allows it to continue functioning.

Business models require refining over time, such as when a previously unique technology becomes outdated (Teece, 2010). This may require a revision of the HR practices. This is relevant to the previous example of American Express, where the business strategy was differentiation through exceptional customer service. This translates to the business model by allowing AMEX to charge vendors a higher interchange fee, which the vendor pays to facilitate payment. This results in higher revenue for AMEX. However, AMEX's business model has evolved, with increasing focus on mobile platforms and contactless payments. This has required AMEX to acquire fintechs and build highly technical and agile product and technology teams, essentially altering the business model and requiring HR practices to grow their focus on technical capabilities, mergers and acquisitions and organizational change.

Systemic design methodology. The above theory and research indicate that strategy and business model are key content inputs into the HR plan. With that said, the authors are not arguing that there is a specific bundle of practices that should be applied to each strategy or business model (Schuler and Jackson, 1987; Takeuchi, 2009). Such an approach would run counter to RBV, as competing firms using similar strategies could copy each other's practices. Instead, the authors suggest shaping the HR plan in a unique way that satisfies RBV. For example, how can the workforce support the business model in a socially complex, inimitable way? How can the firm exploit unique historical conditions which position people to enable the strategy?

To answer this, the authors suggest starting by viewing human resources planning as a "wicked problem" (Rittel and Webber, 1973) in the context of systemic design methodology (SDM). SDM is an interdisciplinary approach that uses design methodology and systems thinking to solve wicked problems, which are "...complex situation(s) that cannot be reduced and analyzed with the techniques of classical problem solving and decision making" (Jones, 2014). Human resources planning meets this definition because, when it satisfies RBV, it is dynamic, resistant to definitive solutions and requires creativity and innovation. This fosters the uniqueness and inimitability required for lasting value.

Before proceeding, the authors wish to clarify a potential point of confusion between the terms "systemic design," "systematic design," and "systems design." Each of these terms corresponds to a different line of research. Systematic design is used in product development and engineering, and is a structured step-by-step methodology to solve problems with logical reasoning (Pahl and Beitz, 2007). Systems design, on the other hand, is a practice where specialists architect large-scale information systems in fields like software development, engineering and technology (Turner, 1986). Neither of these two is the focus of this paper.

Instead, this paper focuses on systemic design methodology (SDM). Systemic design focuses on a holistic and interconnected approach. SDM can guide HR planning to incorporate complex, interconnected situations by fostering collaboration among stakeholders, while maintaining continuous learning and adaptivity (Jones, 2014). Various SDM models have been suggested (Jones, 2014; Saarelainen, 2024; Rosini and Barbero, 2021; Ryan, 2014). For the purposes of HR planning, we will divide SDM into 4

key steps: 1) Discovery and Diagnosis 2) Framing and Concept Formation 3) Planning and Intervention 4) Evaluation. Following is an overview of these steps.

The first step is Discovery and Diagnosis. This step involves gathering multiple perspectives to frame and reframe organizational problems. In organizational applications, Rosini and Barbero (2021) recommend reviewing the organizational chart and key relationships, as well as environmental factors, such as industry, employee demographics, and organizational culture. This identifies a variety of stakeholders and inputs, clarifying the unique historical conditions necessary for RBV (Barney, 1991). In addition, because new HR initiatives typically require change management, early engagement of various stakeholders improves buy-in.

The second step is Framing and Concept Formation. This is an iterative process to identify the main challenge. Framing is the act of making sense of a complex reality by identifying, arranging and shaping a view that can be used for analysis and action (Saarelainen, 2024). Framing shifts one's perspective to discover insights and opportunities that may have been missed (Ryan, 2014). Rosini and Barbero (2021) describe this step as the identification of the main challenge facing the organization, such as the need for growth or a change in culture. In HR, this is where one may uncover the disconnect between human resources practices and the business model and/or strategy.

The third step is Planning and Intervention. This is where solutions are created and deployed, targeting groups where interventions can be tested. In the case of HR practices, this may start with a pilot group. The key is identifying multiple solutions that can be deployed with the highest impact (Saarelainen, 2024). This process allows HR to refine practices and develop uniqueness (Barney, 1991).

The last step is Evaluation. In this step, the gap between expected outcomes and actual outcomes is evaluated. Ryan (2014) states that gaps are inevitable due to changing environments. However, these gaps provide valuable learning experiences that can be used for future iterations. In HR, a regular survey process can assess whether the necessary employee behaviors are being performed for the strategy and business model. HR can also re-evaluate how distinct its practices are from those of competitors. This further ensures inimitability (Barney, 1991).

In sum, these SDM steps provide a process which allows HR to consider a wide range of inputs, to incorporate strategy and business model in a valuable, rare and inimitable way. In our propositions below, we will provide supporting research and further describe how strategy and business model may be incorporated into HR planning via SDM.

Contributions. This paper will contribute to management theory and practice in a variety of ways. Theoretically, it attempts to merge the resource-based view (Barney, 1991) with systemic design theory. To our knowledge, this is the first attempt to merge these theoretical approaches. From a practitioner's view, these propositions will point toward a new methodology which helps practitioners design HR plans so they provide unique and lasting value.

Propositions.

Proposition 1: Competitive strategy and HR effectiveness. As noted earlier, significant theory and research indicate that business outcomes will be improved if HR practices support the strategy. In an early study, Schuler and Jackson (1987) found that aligning HR practices with competitive strategy was related to improved firm performance at United Parcel Service, Honda, and Frost Inc., a Michigan-based manufacturer. At Honda, for example, Schuler and Jackson found that offering extensive training, job security and egalitarian pay practices helped facilitate behaviors needed for its quality enhancement strategy. Takeuchi (2009) found, in a study of Japanese firms, that firm performance, as measured by market growth rate, profit margin, and return of assets, was positively related to the use of specific HR practices under different strategies.

More recent research also suggests that HR practices can facilitate targeted behaviors. For example, Kundia, Yehuda, and Ullah (2023) found, in a three-wave study of employees from several industries, that perceptions of HR practices were related to turnover and knowledge-sharing. Kutieshat and Farmanesh (2022) found, in a study of 450 Jordanian education employees, that HR practices were related to innovation behaviors. Choo (2024) recently found, in a study of 227 Korean firms from various industries,

that firms pursuing ambidextrous strategy (both cost leadership and differentiation) performed better when HRM investment was high.

In sum, these studies indicate that there is a positive relationship between the use of carefully selected HR practices on the one hand, and firm performance on the other. In this sense, they provide backing for the first component of RBV: that the resource must provide value to the organization. In these cases, that value is evidenced through improved revenue and efficiency.

Proposition 1. HR Plan effectiveness will be higher when HR practices support the competitive strategy.

Proposition 2: Business model and HR effectiveness. As noted earlier, there has been less examination of the relationship between HR and business model than there has been between HR and strategy. Even so, some research supports the argument that HR practices should be aligned with business model. Malik, Pereira, and Budhwar (2018) argued that human resources practices, such as learning and development, work design, training, hiring and performance management all contribute directly to a business model's effectiveness in creating and realizing value. In their study of Danish businesses, Nielsen and Montemari (2012) found that human resources practices were related to organizational performance for firms using a network-based business model. In their review of studies focused on business model innovation (BMI), Andreini et al. (2021) found that knowledge-shaping and learning processes were key components of BMI. They defined knowledge-shaping as the processes used to generate innovative ideas and disseminate them throughout the organization. This is a process that is typically owned in the learning and development (knowledge management) team of HR.

Similarly to strategy, the above research indicates that carefully selected HR practices will help facilitate the execution of the business model. This also establishes value in the context of RBV.

Proposition 2. HR Plan effectiveness will be higher when HR practices support the business model.

Proposition 3: SDM and HR effectiveness. While the above research supports the alignment between HR practices and strategy/business model, it does not establish rarity or inimitability. Therefore, we argue that HR plan effectiveness will be most effective when the above factors are incorporated under systemic design methodology (SDM).

Under SDM, there is no single approach for each strategy and business model. Therefore, we will illustrate its application via example, using the previously described four steps. The first step is Discovery and Diagnosis. In our example, a firm with a differentiation strategy is experiencing employee retention problems. It is paying higher than its peers, and it rewards employees for innovation. Without SDM, the firm's diagnosis might simply include reviewing compensation practices. However, SDM leads to a more holistic assessment. The firm gathers insights from stakeholders on its culture, previous interventions, structure, leadership background, unique interpersonal relationships, and location footprint. This considers the firm's differentiation strategy and uniqueness.

Continuing with our example, the second step is Framing and Concept Formation. Without SDM, the firm may conclude that the retention problem is pay, and it should pay even more. With SDM, the firm reframes the problem to account for its learnings in the previous step. It determines that the problem is a recent leadership decision: a new executive has changed the compensation focus to reward customer satisfaction, rather than innovation. Employees are confused about how to succeed, resulting in turnover.

The firm is now ready for the Planning and Intervention step. One possible intervention is to keep the focus on customer service, and improve communication so employees understand pay's strategic role. Another intervention would be to modify the performance management process to better incentivize innovation. With SDM, HR planning considers the complexity of the "wicked problem," driving solutions that are unique, valuable and lasting.

In the last step, Evaluation, the gap between the intended outcome and the actual outcome is examined. Our firm may find that despite its efforts, the actual outcome is only a modest improvement in retention. With SDM, the firm embraces this as a learning opportunity and repeats the SDM steps. This time, the HR team conducts focus groups with employees. It discovers that customer satisfaction surveys

were conducted for only large accounts, where employees are successfully executing the differentiation strategy. The new leader doesn't acknowledge smaller accounts, making a subset of employees feel unappreciated. Practicing SDM, the firm learned that it needed to include focus groups in the discovery and diagnosis step. Competitors cannot easily replicate how the firm adjusts its compensation focus to incentivize these strategic behaviors.

Some research indicates that SDM can be used to guide the development of organizational initiatives. Systemic design principles have been used in developing initiatives related to selecting managerial talent in Italian design firms (Cautela, Simoni and Moran, 2020), public transportation (Yan, Lu, Arquilla, Brevi, Rampino and Caruso, 2023), and education (Jacoby and Van Ael, 2021). A highly relevant application of SDM has been for work processes in the Australian Taxation Office (ATO) (Kaur, 2020). Kaur describes how systemic design principles of holistic thinking and multiple perspectives helped the ATO improve its communication and problem identification processes for taxpayers.

Proposition 3. HR Plan effectiveness will be most effective when strategy and business model are incorporated using systemic design methodology (SDM).

Discussion, Limitations, and Future Research.

In this paper, we have offered a framework for helping to ensure that HR plans, when aligned to strategy and business model, provide value that is rare, inimitable, and difficult to substitute (Barney, 1991). Future research should test these propositions. To do so, one element that should be studied is time. Previous studies have typically examined the relationship between HR practices, strategy and performance at a single point in time. This can demonstrate HR's value but not its inimitability. By examining whether HR practices contribute value over time, researchers will better understand the importance of inimitability. Such a study could compare performance at firms which use the recommended SDM approach vs. those which do not. Our expectation is that firms which use the SDM approach will find that HR provides greater value over time.

These studies could also examine whether the benefits of SDM are proportionate across business model and strategy. While strategy has enjoyed strong focus in the HR literature, business model is comparatively less studied. Research could focus on SDM's use in identifying employee behaviors that support the business model, along with the necessary HR practices. We expect that SDM's contribution to HR's lasting value will be commensurate across strategy and business model.

From a practitioner perspective, a more comprehensive explanation is needed describing how to apply SDM to all phases of human resource planning. This would likely focus on aspects of HR which shape everyday employee behavior, such as talent management, rewards, employee engagement and culture.

In addition, the SDM approach can enable HR practitioners to identify holistic solutions that address the root causes of employee-related challenges. Because a collaborative approach has been taken to identify the solution, the outcome is likely to be more innovative with multiple adaptive interventions planned for long-term impact.

A potential limitation of the proposed approach is the resources it requires. As illustrated in the example above, SDM requires that high-level leaders come together and align on organizational goals and culture. This is a significant resource request. HR practitioners would need to ensure that this approach is project-managed with great efficiency.

Conclusion.

We extend HR theory by reviewing research on RBV and SDM, identifying where HR planning has failed to live up to the requirements of RBV. Based on this review, we propose that SDM offers methodology which allows HR planning to occur in a way that satisfies RBV. Research is needed to further validate these propositions. If validated, this approach can be implemented as a framework for HR planning.

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Customer perceptions towards Namma Yatri: An empirical study

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Key words

App usability, Customer perceptions, Driver behavior, Mobility-as-a-service, Ride-hailing services, Service quality.

Abstract

This study examines customer perceptions of Namma Yatri, a ride-hailing service operating in Bengaluru, and compares it with competitors like Ola, Uber and Rapido. The research aims to understand key factors influencing customer preferences, including pricing, ride availability, driver behavior, app usability and overall service quality.

This study employs a survey-based quantitative research design to analyze customer perceptions in Bengaluru towards Namma Yatri. The primary data for this study was collected through a structured questionnaire, consisting of both closed-ended and Likert-scale questions. The survey was distributed through Google Forms to reach a diverse group of respondents. The data was collected from frequent ride-hailing users, including daily commuters, office-goers, students and tourists.

Findings indicate that price competitiveness, ride availability and driver behavior play a crucial role in shaping customer choices. While most users find Namma Yatri's pricing similar to competitors, a significant percentage perceive it as a cost-effective alternative. Additionally, ride availability and driver behavior were rated as better or similar to other services.

Safety and availability emerged as the most relevant factors in selecting a ride-hailing service, highlighting the need for reliable and secure transportation options. A majority of respondents expressed willingness to continue using Namma Yatri, with many considering it a viable alternative to other platforms. However, some areas, such as customer support and app usability, showed scope for improvement.

The study provides valuable insights into customer expectations and service gaps, offering recommendations to enhance user experience, trust, and market positioning for Namma Yatri. By addressing key customer concerns and strengthening its service offerings, Namma Yatri can further establish itself as a preferred ride-hailing choice in Bengaluru.

Introduction

The online taxi service industry is commonly referred to as the "Ride-Hailing Industry" or "Ride-Sharing Industry." It falls under the broader "Mobility-as-a-Service (MaaS)" sector and is a subset of the "Transportation and Logistics Industry."

Key segments within this industry include:

- Ride-Hailing Services (e.g., Uber, Ola, Lyft)
- Ride-Sharing / Carpooling (e.g., BlaBlaCar)
- Corporate Mobility Solutions (e.g., Uber for Business)
- Luxury / Premium Ride Services (e.g., Blacklane)
- Micro-Mobility Services (e.g., e-scooters, bike rentals)

The ride-hailing industry has undergone significant transformations in recent years, influenced by technological advancements, evolving business models and shifting market dynamics.

Market trends

- Global expansion: The ride-hailing sector has seen rapid global growth, with companies like Uber and Lyft expanding their services across continents. This expansion is driven by increasing urbanization and the demand for convenient transportation options.

- Technological integration: The integration of autonomous vehicles is reshaping the industry. For instance, Tesla plans to launch its autonomous robotaxi service in Austin, Texas, by 2025, directly competing with Uber and Waymo's self-driving initiatives (Higgins, 2025).
- Competitive pricing: Companies like Lyft have adjusted their pricing strategies to remain competitive, leading to reduced base prices and increased promotional offers (Loten, 2025).

Business Models

- Direct negotiation platforms: Some companies, such as inDrive, have adopted unique models where passengers and drivers negotiate fares directly, promoting transparency and fairness (Purdy, 2025).
- Autonomous vehicle partnerships: Ride-hailing firms are increasingly partnering with autonomous vehicle manufacturers to integrate self-driving cars into their fleets, aiming to reduce operational costs and enhance efficiency (Higgins, 2025).
- Diversified mobility services: Companies like Gojek have evolved into super-apps, offering a range of services beyond ride-hailing, including food delivery and digital payments, thereby increasing user engagement and revenue streams.

Valuation Approaches

- Market capitalization: Publicly traded companies like Uber are valued based on their market capitalization, which reflects investor perceptions of future growth and profitability.
- Funding rounds: Private companies often undergo multiple funding rounds, with valuations increasing as they demonstrate growth potential. For example, inDrive achieved unicorn status after closing a \$150 million investment round, valuing the company at \$1.23 billion (Purdy, 2025).
- Revenue multiples: Investors may use revenue multiples to value ride-hailing companies, considering factors like gross bookings, revenue growth rates, and market share.

Profile of the Company

Namma Yatri is a Bengaluru-based ride-hailing platform that offers a transparent, commission-free and driver-centric mobility solution. Designed to empower auto-rickshaw drivers while providing affordable and seamless transportation for passengers, the platform eliminates intermediaries, allowing direct driver-passenger interaction. Unlike traditional ride-hailing services that charge high commissions, Namma Yatri ensures that drivers take home their full earnings while passengers benefit from fair pricing.

The company's mission is to create a fair and transparent ride-hailing ecosystem that prioritizes both drivers and passengers. With a vision to be the most trusted and driver-friendly mobility service, Namma Yatri focuses on affordability, accessibility and efficiency. Key features of the platform include a zero-commission model, direct connections between drivers and passengers, UPI-based digital payments and a user-friendly interface. By removing hidden charges and offering fare transparency, Namma Yatri ensures a hassle-free experience for daily commuters, office-goers, students and tourists.

Namma Yatri stands out from its competitors like Ola, Uber and Rapido by eliminating commissions, resulting in better earnings for drivers and lower fares for customers. The company has also received strong community and government support as it aligns with open mobility initiatives to enhance driver welfare. With a growing network of auto-rickshaw drivers and a commitment to ethical ride-hailing, Namma Yatri is redefining urban mobility in Bengaluru. Through its customer-friendly approach, the platform continues to provide a reliable, efficient and cost-effective alternative for commuters in the city.

Literature Review

The online taxi services market in India has experienced significant growth over the past decade, driven by technological advancements and changing consumer preferences. This literature review synthesizes key studies and reports to provide an overview of the industry's evolution, market dynamics, consumer perceptions and challenges.

Evolution and Market Dynamics

The organized taxi market in India began with the introduction of Mega Cabs in 2000, transitioning from traditional car ownership to ride-sharing models. The advent of GPS and GPRS-enabled systems further propelled the industry's growth. In the fiscal year (FY) 2019, the organized taxi market constituted

approximately 11.5% of the total taxi market revenue in India. The online taxi services segment was valued at INR 29.75 billion in FY 2019 and is projected to grow at a compound annual growth rate (CAGR) of 16.60%, reaching INR 61.59 billion by 2024 (businesswire, 2020).

The market is predominantly led by two major players: ANI Technologies Private Limited (Ola Cabs) and Uber India Systems Private Limited. In FY 2019, Ola Cabs captured approximately 72.44% of the market share, while Uber India held around 21.01%. Other competitors, including Meru Mobility Tech Private Limited and Mega Cabs Private Limited, collectively accounted for the remaining 6.55% of the market (businesswire, 2020).

Consumer Perceptions and Satisfaction

Several studies have examined consumer perceptions of online taxi services in India. Rajesh and Chincholkar (2018) conducted a study focusing on the differences between Ola and Uber customers in Mumbai. The findings indicated that female passengers preferred Uber over Ola; however, Ola was perceived as offering greater safety.

Another study by Khan et al. (2016) identified key factors influencing customer satisfaction in the Indian taxi service market. The research highlighted that service quality, driver behavior and pricing significantly impacted customer satisfaction levels.

Challenges and Opportunities

Despite rapid growth, the online taxi services market in India faces several challenges. These include regulatory hurdles, driver dissatisfaction due to reduced incentives, and increased competition from affordable ride-sharing services. Additionally, issues such as extended wait times and surge pricing have affected customer satisfaction (businesswire, 2020).

Opportunities for growth lie in enhancing service quality, addressing regulatory concerns and leveraging technological advancements to improve customer experience. Focusing on safety measures, especially for female passengers, and ensuring fair compensation for drivers are critical for sustainable growth.

The online taxi services market in India has transformed the transportation landscape, offering convenience and flexibility to consumers. While dominant players like Ola and Uber continue to lead, addressing challenges related to customer satisfaction, regulatory compliance and driver welfare is essential for the industry's sustainable development.

Regulatory and Operational Challenges

Globally, online taxi services face challenges related to regulatory compliance, safety concerns and competition with traditional taxi services. Companies must navigate complex legal frameworks that vary by country and even by city. For instance, Uber's operations have been suspended or restricted in several markets due to non-compliance with local regulations (Rauch & Schleicher, 2015). Additionally, ensuring passenger and driver safety remains a critical concern, prompting companies to implement stringent background checks and safety features within their apps (Rayle et al., 2016).

Impact of the COVID-19 Pandemic

The COVID-19 pandemic significantly impacted the global ride-hailing industry, leading to decreased demand and operational challenges. Companies like Uber and DiDi diversified their services to include delivery options and introduced safety measures to regain rider confidence (Huang et al., 2021). The pandemic also accelerated the integration of digital payment systems and contactless services, reshaping consumer expectations and operational standards in the industry.

The global online taxi services industry continues to evolve, influenced by technological innovations, regulatory landscapes and changing consumer behaviors. Companies that adapt to local market dynamics, comply with regulatory requirements, and diversify their service offerings are more likely to achieve sustainable growth.

Research Methodology

Research Design

This study employs a survey-based quantitative research design to analyze customer perceptions in Bengaluru towards Namma Yatri. The survey method was chosen for its efficiency in gathering large-scale responses and providing measurable insights into customer opinions, experiences and preferences.

Data Collection Method

The primary data for this study was collected through a structured questionnaire, designed to capture various aspects of customer perceptions, including service quality, pricing, ride availability, driver behavior and overall satisfaction. The questionnaire consisted of both closed-ended and Likert-scale questions, allowing respondents to express their opinions numerically for easy analysis. The survey was distributed through Google Forms to reach a diverse group of respondents.

Sampling Method & Participants

Due to small size of respondents group, all respondents were included in the analysis.

- Sample size: 106
- Demographics considered: Age, gender, location, frequency of use and other relevant factors.

Data Analysis

The collected responses were analyzed using descriptive statistics, including percentages, mean scores and frequency distributions, to identify key trends and insights. Additionally, comparative analysis was conducted to evaluate how different customer segments perceive the service.

Ethical Considerations

The study adhered to ethical research practices:

- Participation was voluntary, and respondents provided informed consent before completing the survey.
- Responses were kept anonymous and confidential to ensure privacy.
- The data was used solely for research purposes without any commercial intent.

By following this methodology, the study aims to provide a clear and objective understanding of customer perception regarding Namma Yatri and its standing among competitors.

Data Analysis and Findings

Demographics of Respondents

The largest segment, making up 50%, belongs to the 18-24 age group, indicating that a significant portion of users are young adults. The 25-30 and 30-40 age groups each account for 17% of the respondents, showing a balanced representation of middle-aged users. The 40 and above category represents 9%, while the Below 18 category is the smallest at 7%. This distribution suggests that Namma Yatri is primarily used by younger individuals, with moderate engagement from middle-aged and older users. 70% of the respondents are female, while 30% are male. This indicates that the survey had a significantly higher participation from female users compared to male users.

The majority of respondents (67 individuals) are students, indicating that younger individuals, particularly those in educational institutions, form the largest user group of Namma Yatri. 24 participants are working professionals, making them the second-largest group. Homemakers (9 respondents), other occupations (3 respondents), and retired individuals (2 respondents) have lower representation in the survey. This data suggests that students and working professionals are the primary users of Namma Yatri, possibly due to their frequent commuting needs.

The largest group (38 respondents) uses taxi services occasionally, indicating that many users rely on taxis only when necessary. A significant number (31 respondents) use taxis daily, showing a strong dependency on ride-hailing services for regular commuting. 19 respondents use taxis 2-3 times a week, while smaller groups use taxis rarely (11 respondents) or once a week (6 respondents). This data suggests that while a large portion of users depend on taxis frequently, a considerable number use them only on an as-needed basis.

Namma Yatri app

A significant 83% of respondents have used the Namma Yatri app, indicating a high level of awareness and adoption. The high percentage of users reflects the app's popularity and acceptance among commuters, while the smaller group of non-users may represent those who rely on other transportation options or are unaware of the service.

The majority, 70 respondents, discovered the Namma Yatri app through friends and family, highlighting the strong influence of word-of-mouth recommendations. 30 respondents became aware of Namma Yatri via social media, indicating the effectiveness of digital platforms in spreading awareness. This data suggests that personal recommendations and online presence play a crucial role in promoting the app.

The largest segment, 37 respondents, indicated that they rarely use the Namma Yatri app, suggesting limited engagement. 25 respondents use it 2-3 times a week, showing a moderate level of usage. 24 respondents use it occasionally, while only 10 respondents use it daily, indicating that regular users are relatively low. This data suggests that while some users engage with the Namma Yatri app frequently, a significant portion of respondents use it infrequently or on an occasional basis.

The majority of respondents (82) rated their experience with Namma Yatri app as good, indicating a generally positive perception of the app. 11 respondents rated their experience as excellent, further reinforcing a favorable impression. This suggests that while most users are satisfied with the app, there are some areas that may require improvement to enhance user experience.

A significant number of respondents (40) rated the ease of booking at Namma Yatri app as excellent, followed by 34 respondents who rated it as moderate and 26 who rated it as good. This indicates that while most users find the booking process convenient, there is still a portion of users who face difficulties and may require improvements in the booking system.

The highest number of respondents (46) rated driver behavior as excellent, followed by 35 respondents who gave a neutral/average rating. 17 respondents rated it as good. This indicates that most users had a positive experience with driver behavior, but a portion of users faced issues, suggesting room for improvement in ensuring consistently good service.

The distribution of ratings for Pricing & Affordability of the Namma Yatri app are relatively balanced, with 34 respondents rating it neutral/average, followed by 33 giving a good and 32 giving an excellent rating. Overall, pricing is positively received, but there is room for improvement to satisfy users who rated it lower.

The distribution of ratings for Ride Availability on the Namma Yatri app indicates that ride availability is generally rated neutral to excellent by most respondents. Overall, the ride availability is well-received, but improvements could be made to ensure more consistent availability, especially for users who rated it lower.

The distribution of ratings for App Performance of the Namma Yatri app indicates mixed feedback, with a significant portion of users rating it as average or excellent. The high number of neutral 3 ratings suggests that while the app functions adequately, there may be room for optimization (e.g., faster loading times, fewer crashes). Improvements in speed, reliability and bug fixes could enhance user satisfaction and shift more ratings towards excellent.

Comparative landscape

Uber and Rapido dominate the competition, suggesting that customers prefer these services over Namma Yatri for various reasons such as availability, pricing or service quality. Ola's lower number indicates it may not be as popular as Uber or Rapido in this market.

Since most users (70%) see no major pricing advantage, Namma Yatri might not be perceived as a cheaper alternative. 24 users (minority) consider it better priced, which means some customers do find cost savings with Namma Yatri. The 11 users who find it worse could indicate inconsistencies in pricing, possibly due to dynamic pricing or surge fares.

Most users (58%) do not see a significant advantage in ride availability compared to other platforms. 40 users (a substantial number) believe ride availability is better, which is a positive indicator. Only 7 users feel it is worse, suggesting that ride availability issues are not a major concern.

Most users (67%) feel there is no major difference between Namma Yatri and its competitors regarding driver behavior. A good number (34%) see an improvement, which is a positive sign for Namma Yatri. The low dissatisfaction (4 users) suggests that driver behavior is generally not a major issue.

Most users (70) feel no major difference between Namma Yatri's app usability and competitors. A notable portion (30) finds it better, indicating a positive user experience. Very few users (5) have a negative experience, which suggests that app performance issues are minimal.

The users' preference for Namma Yatri over other taxi services indicates that a majority (52%) are flexible and will choose Namma Yatri based on factors like pricing, availability or convenience. A notable 26% show clear preference, indicating that Namma Yatri has a loyal customer base. 22% of users prefer other services, possibly due to issues like pricing, app usability or availability. This data suggests that while Namma Yatri has a decent user base, improvements can help capture more loyalty.

The most relevant factor affecting choice of taxi service provider based on user responses are availability, safety and price. Availability (42 votes) is the top factor – most users prioritize whether rides are easily accessible. Safety (31 votes) is the second most important – many users consider security a critical aspect. Price (14 votes) matters but is less dominant – suggests that affordability is important but not the primary driver. This data indicates that users prioritize reliability and security over cost and additional features when selecting a taxi service provider.

When asked about whether users would recommend Namma Yatri to others, the response was majorly in affirmative. 57% of respondents said "Yes" – indicating a strong positive perception of the service. 34% responded with "Maybe" – suggesting they have a neutral stance, possibly due to mixed experiences. Only 9% said "No" – a relatively small proportion of dissatisfied users. Overall, the high percentage of recommendations (Yes + Maybe = 91%) suggests a positive outlook, but addressing user concerns could further strengthen brand loyalty and advocacy.

Key improvement suggestions from respondents

The key improvements suggested for Namma Yatri include enhancing safety features, particularly for female passengers and increasing ride availability to ensure faster and more reliable service. Many users emphasized the need for better driver behavior, including preventing drivers from demanding extra money after accepting rides. Lowering ride fares and improving customer support were also common concerns. Additionally, some respondents suggested enhancing the app interface for a smoother user experience. However, a few users stated that they were satisfied with the service and did not see a need for any changes.

Conclusions

The study on customer perception of Namma Yatri in comparison with its competitors reveals that the platform is well-received for its pricing, ride availability and driver behavior. A significant portion of users find the service either better or similar to established players like Ola, Uber and Rapido. Key factors influencing customer choice, such as safety, affordability and availability, highlight Namma Yatri's competitive positioning in the market. However, aspects like customer support and app usability require further enhancements to ensure a seamless user experience. The research also indicates that while many customers are willing to continue using Namma Yatri, a portion remains undecided or reluctant to switch entirely from other platforms.

Suggestions

- Enhancing customer support – A more responsive helpdesk and grievance resolution system can improve user trust and satisfaction. Implementing live chat support or a dedicated helpline can address customer concerns more efficiently.
- Improving app usability – A more intuitive user interface, faster booking process and bug fixes will ensure a smoother experience for customers, reducing frustration and increasing retention.
- Strengthening driver training & incentives – While driver behavior is rated positively, further training programs on customer service and safety protocols will enhance the experience. Additionally, incentive programs can help retain quality drivers and encourage better service.
- Enhancing ride availability – Ensuring a larger and more reliable fleet of drivers, especially during peak hours and in high-demand locations, can help Namma Yatri compete more effectively with larger platforms.

- Promotional campaigns & awareness – Running targeted marketing campaigns, referral programs and discounts can encourage more users to try and stick with Namma Yatri.
- Focus on safety measures – Implementing advanced safety features, like emergency buttons, real-time tracking and background checks on drivers, will help build customer confidence.

By addressing these areas, Namma Yatri can solidify its market position, attract a loyal customer base and further differentiate itself from competitors in the ride-hailing industry.

Limitations

While the study provides valuable insights, it has some limitations.

- Self-reported data: Respondents' answers may be subject to personal bias.
- Sample representation: Despite efforts to ensure diversity, the sample may not fully represent the entire customer base.
- Time constraints: The study was conducted within a limited timeframe, which may impact the depth of analysis.

The key to enhancing the reliability of this study is to expand the scope of the study to more cities/states. The sample size should be increased, considering that the data was collected using Google Forms, the reach can be expanded. Some of the data points can be cross-checked using an experimental design, since the availability and pricing can be verified in real-time across ride-hailing platforms.

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Tourism in the Digital Age: *Preparing the Workforce for a Sustainable Future*

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Digital skills, Green skills, Soft skills, Sustainable workforce, Tourism.

Abstract

In the general framework of the country's economic development, tourism has a significant importance. This is also because Albania offers potential maritime, mountainous tourists, etc. In these conditions, the need to advance the development of this economic sector becomes present. Determining the way of functioning, the evisceration of development problems posed by the tourism sector, the connection of mutual influences with other phenomena, etc., as environmental conservation and innovative developments should be preceded by study work.

In recent decades, there has been an increase in the field of digital development, which has enabled the fundamental transformation of the way business is done in many areas of the economy. Digital developments are applications that have given a different meaning and perspective to the tourism and hospitality industry as one of the most impactful areas of this development.

This study investigates the digital abilities that are most in-demand in Albanian tourism. The present spread of these abilities among workers in tourism-related businesses, including hotels, guesthouses, restaurants, and travel agencies, is examined. Significant gaps exist between the digital capabilities of the workforce now and the digital skills that will be required in the future, according to quantitative study that includes surveys.

ICT enables innovative and advanced digital solutions that have improved and revolutionized tourism products and services by increasing the productivity of tourist businesses on the one hand and empowering and consolidating the sustainability of the tourism sector on the other. Both of these directions require that the workforce of this sector possesses competencies and digital skills.

Introduction

International tourism recovered to 96% of its pre-pandemic levels in the seven months ending July 2024, thanks to strong demand in Europe and the reopening of markets in Asia and the Pacific. Nearly 790 million tourists visited other countries in the first seven months of 2024, an 11% increase over 2023 and a mere 4% decrease from 2019. According to data, the year had a strong start, but the second quarter was more muted (*The World Tourism Barometer by UN Tourism, 2024*).

The Mediterranean and Southern Europe continue to be the most popular travel destinations in Europe, both traditional and non-traditional, based on year-to-date data. The European tourism industry started to recover again in the second quarter of 2024. Both international arrivals (+6%) and overnights (+7%) surpassed 2019 figures, signifying year-over-year gains of 12% and 10%, respectively. The expansion is being driven by strong intraregional travel from Germany, France, Italy, and the Netherlands (*the European Travel Commission, ETC, 2024*).

Compared to 2019 levels, arrivals to lesser-known locations like Serbia (+40%) and Bulgaria (+29%) also increased significantly, in addition to popular ones like Malta (+37%), Portugal (+26%), and Turkey (+22%). Part of the reason for these places' ongoing appeal is that they all offer reasonably priced experiences with generally pleasant weather.

The Nordic countries are also growing in popularity, as seen by the rise of international overnights in Denmark (+38%), Norway (+18%), and Sweden (+9%). This implies that success is expanding outside of Southern Europe and in areas that are somewhat more expensive. The Baltic region, however, is also struggling, with foreign arrivals in Latvia (-24%), Estonia (-16%), and Lithuania (-15%) continuing to fall

well below 2019 levels.

One of the most well-liked travel destinations in the Balkans is Albania. In 2024, the country experienced an unprecedented surge in tourism, drawing visitors from all around the world. The World Tourism Organization (UN Tourism) reports that since 2019, or prior to the outbreak, Albania's tourism-related revenue has increased by 128%. Globally, this is the highest number.

In the first nine months of 2024, the country's tourism season ended with approximately 9.7 million foreign visitors. International visitor arrivals are somewhat below last year's record levels and below the 14 million visitors, Albanian officials had planned to draw. Albania witnessed a 56% increase in foreign visitor visits in 2023, ranking fourth globally for the largest percentage gain, according to UN Tourism.

The major drivers of Albania's strong 3.3% economic growth in 2024 are expected to be private consumption, tourism, and construction. Growth is expected to moderately accelerate to 3.4% in 2025. It is anticipated that poverty will continue to decline as incomes and employment rise. The nation's medium-term prospects are largely dependent on structural reforms and the global recovery (*The World Bank, Oct 2024*).

Literature Review

Tourism represents one of the largest industry branches in the world. Based on Pshenichnykh & Novi (2023): "The tourism and hospitality industry has developed quite quickly over the past decades, remaining one of the most attractive sectors of the economy." This branch of industry is a significant source of income and enables employment growth in the country. According to Cárdenas-García, et al. (2015): "The tourism sector is an essential income source, especially for developing countries with tourism potential. "Tourism also enables the increase of social emancipation, as it allows people to create ideas and understand the culture, civilization and religious problems of another country.

According to Pektas (2022): "People's desire to travel outside of their residence for different reasons is old, at least as written history. Trade, religion, holiday, Olympic Games, and the desire to regain health were the main reasons of people's travel." (Casson, 1994). Regarding the subjectivity of destination choice by tourists, Vengesai et al (2009) define that: "Destination attractiveness is distinguished from destination." Competition between destinations should be a focal point of attention for tour operators in their entirety. In the competition, tourism environment takes importance in its complexity, with the aim of sustainable tourism.

Sustainable tourism refers to sustainable practices and the attention of researchers to recognize all positive and negative impacts of tourism. The tourism sector represents a specific opportunity with considerable impact on citizens to build a more inclusive and sustainable future. Knowing the impacts increases people's commitment to minimizing or avoiding negative impacts. The study focuses on the negative impacts of tourism, because it is related to some aspects of the tourism perspective, such as economic aspects, damage to the natural environment and tourist overpopulation.

One of the negative impacts that are of worry about is increasing the intensity of emissions. The UN Environment Programme reports that, "A 42% reduction in current global emissions overall by 2030 (and 57% by 2035) is needed." In this context, they also refer to the cause of this situation: "The main cause of the increase in emissions is the high growth of tourist demand. The rapidly expanding carbon footprint is mainly from aviation (21%), the use of gasoline and diesel vehicles (17%) and utility services such as electricity supply (16%)." Higham & Sun (2024).

The international community's 2015 Paris Agreement establishes ambitious targets for reducing greenhouse gas emissions and calls for worldwide cooperation and commitment to combating climate change (UNFCCC, 2015). Fennell (2022) states that the 2030 Sustainable Development Goal (SDG 13) is to reduce emissions and increase climate resilience. (*Agenda for Sustainable Development, 2022*).

The performance of all tourism-related businesses is affected by environmental issues. The hotels are most affected. Because of their large fixed asset investments and lack of flexibility due to the difficulty of moving their operations, hotels are among the most vulnerable tourism enterprises to climate change (Gössling, 2011; Su et al., 2013). The service-oriented character of the hotel industry, which involves a high level of human participation in operations and great visibility to stakeholders, makes responding to climate change difficult. (Fennell, 2022).

In addition to emission minimization, over tourism is an influential factor in sustainable tourism. Leahy (2023) admits that: "Basically, over tourism is a lot of people in one place at any given time. While there is not a final figure that determines the number of visitors allowed, a bunch of economic, social and environmental factors determine if and how numbers are growing."

A clean environment is a preference of tourists, regardless of the tourist destination. Environmental management is therefore an important factor present and future, as it conditions the development of successful and sustainable tourism. According to Söderholm (2020), tackling climatic and environmental issues obviously calls for both engineering and natural science knowledge of the several technical solutions that can be implemented to lessen adverse effects (e.g., carbon-free energy systems).

"Circular economy (CE) is a more holistic approach that advocates towards extracting value from waste and achieving sustainability goals.", Sharma et al. (2020). This is how we can preserve the clean environment. Neves & Marques (2022) acknowledges that: "A paradigm shift from a linear economy to a circular economy is essential to reduce pressure on the environment and improve the security of primary raw material supply." The development of green technologies is a condition towards a new world. Wu & Strezov (2023) emphasize that: "Green technologies will help create new relationships between humans, nature as well as the new world."

Human/nature relations are important for any economic sector, but it is very important in the tourism sector. This is why the WEF (World Economic Forum) in 2018 considered it a problem of focus. "Members of the Travel and Tourism industry community actively work together to shape the future of the sector, foster innovation and new business practices, and inform new policymaking." (WEF).

The innovation we refer to requires a faster orientation to information technology developments. Based on UNWTO (2023): "Tourism was one of the first sectors to digitalize its business processes worldwide, pioneering online booking of air travel and hotels."

While Morozov & Morozova (2019) admit that: "Area with the most active introduction of digital technologies is tourism services." In the future, there will be an increasing necessity to use IT applications. Regarding the digital trend in the 2030s, Statista (2022) predicts that the travel, hospitality, and airline sectors would employ mobile applications, artificial intelligence (AI), cloud computing, automation tools, and self-service more and more. These goals are difficult to meet because, according to WEF (2018), two major barriers to the global adoption of technologies are a lack of capital investments (39%) and skills gaps in local labor markets (89%).

For Lazić et al (2023): "ICT has revolutionized the sector structure by removing barriers to entry, reducing costs, ensuring price transparency, and reforming and increasing the efficiency of services." While for Milovanović et al. (2022), "The implementation of modern ICT solutions through new and improved tourism products and services can alter the customer experience while increasing the sector's productivity and resilience."

According to Carlisle et al. (2021), the EU as a whole will require future digital skills. Similar to Zaragoza-Sáez et al. (2022), this is likewise it. It is acknowledged by Carlisle et al. (2021) that the respondents' country of origin affects these needs. A nation's degree of digitalization is determined by its internet infrastructure, laws and regulations, and how both individuals and companies employ digital solutions, according to the European Bank of Reconstruction and Development (EBRD, 2021).

Tourism development requires a host of digital continuities. Sousa & Rocha (2019) consider that "Different technologies require different skill sets." For Ferrari's et al. (2013) the list of digital competencies includes amongst others, information management, communication and sharing, and technical operations. While Minor et al (2024) stress that: "The hard skills, however, include technical, operational, strategic and basic work skills." UNESCO 2024 report 'Green and Digital Skills for Hospitality and Tourism', highlights the intersection of green and digital transformations within Technical and Vocational Education and Training (TVET) systems. Professional growth in the benefit of digital skills now is a necessity because "Considering the deep penetration of digital technologies in everyday life, digital literacy offers a set of transversal skills that could improve a whole area of activities, from banking operations to civic participation. However, these skills are diverse and vary according to the development of technologies and society." Voda et al (2022).

Research Methodology

From the standpoint of the tourism industry (demand side), the goal of this study is to identify and evaluate the current tourism skills, trends, and developments as well as future needs in relation to digital and sustainable skills (the latter including green and socio-cultural skills).

The capacity to locate, assess, use, distribute, and produce content through the Internet and information technologies, including artificial intelligence, virtual and augmented reality, mobile technologies, and (big) data analytics, is known as digital skills.

Sustainability skills (green and socio-cultural) are environmental management skills, such as resource management to manage waste, water and energy services, and recycling; and sustainable tourism. It has to do with hotel management techniques and sustainable tourism (packages); customer sustainability awareness campaign; events, visitor attractions, and sustainable restaurants; circular economy in the design and management of the tourism value chain, etc. Social and cultural competencies include behavioural and attitude competencies in interpersonal communication (soft skills); intercultural understanding; customer service orientation; interpersonal relationship management, empathy, and collaboration; exhibiting a positive attitude, respect, and intercultural sensitivity; active listening; social progress-promoting competencies that acknowledge the needs of all; accessible tourism for individuals with disabilities; and gender equality.

The relevant data gathered through a (1-5) Likert Scale Questionnaire based Survey were processed and analysed accordingly and a summary of the adequate findings will be projected regarding respondent's perceptions about the current tourism skills, trends and developments, as well as future needs in relation to digital and sustainable skills (green and socio-cultural skills), from the perspective of the tourism industry. For the purpose of this study it's been used a cluster sampling technique reaching a number of 358 respondents who gave their anonymous responses through an online survey conducted by researchers from August to October 2024. They were randomly selected employees, professional, experts, managers, and business owners in tourism and hospitality industry in Albania.

For the purpose of data analysis such techniques as Descriptive Statistics and Comparison based Methods were used. The findings among other things, showed a significant gap between the existing knowledge on tourism skills, and necessary future needs in relation to digital and sustainable skills (green skills and socio-cultural skills), from the perspective of the tourism industry (demand side).

Data analysis and research findings

Performance of tourism sector in Albania

The tourism season in Albania ended with 9.7 million international visitors in the first nine months of 2024. The number of foreign visitors is slightly below the 14 million tourists that Albanian officials had planned to draw, as well as below the record figures reached last year.

From neighbouring Kosovo, about 3.4 million tourists came to Albania, followed by nearly 900,000 from Italy and over 600,000 from North Macedonia. This year also saw an increase in the number of visitors from France (more than 157,000), China (almost 16,000), India (13,000), and the Netherlands (nearly 92,000).

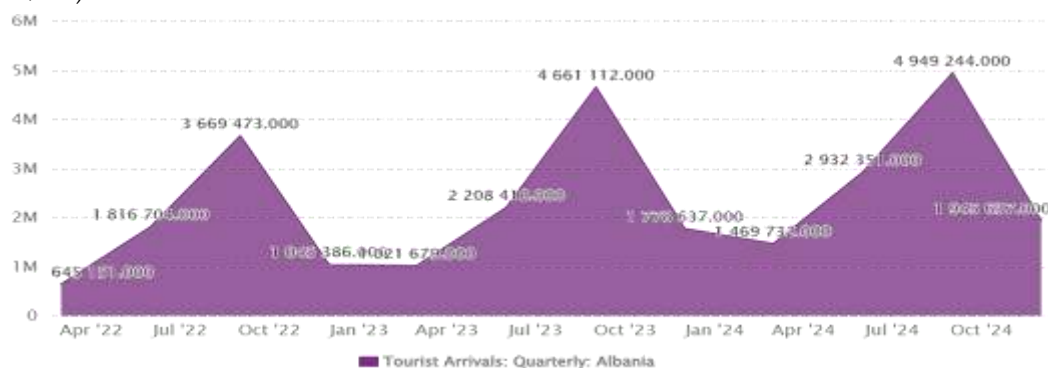


Chart 1. Albania's Visitor Arrivals from Jan 2022 to Dec 2024

The international tourist organization's most current research shows that the sector's GDP contribution in 2023 climbed by more than 37% compared to its 2019 peak. The industry's success is demonstrated by the fact that in 2023, travel and tourism made up one in four of Albania's GDP. The travel and tourism sector supported around 269,000 jobs nationwide, or one in five jobs in Albania. This is a more than 10% increase in jobs supported by the sector compared to 2019. Expenditure on domestic travel exceeded 2019 levels in 2023, and expenditure on foreign travel surged to more than 45% above the 2019 peak (*The World Travel & Tourism Council's – WTTC, 2024*).

Green skills in tourism and hospitality

Environmental management abilities are shown in this chart in a number of categories. It contrasts the present skill level (orange line) with the anticipated or intended level in the future (gray line). This is a thorough analysis: In the majority of skill categories, there is a persistent discrepancy between the present and intended future levels, suggesting room for development. Although they are comparatively good, existing abilities to manage garbage, recycling, and composting (3.93) and reduce energy and water usage (3.86 current score) nevertheless fall short of the intended future levels (4.13 and 4.12, respectively). In contrast, climate change knowledge has a significant gap (current score 3.70), compared to the target level (future score 4.20).

There are a few areas that require serious improvement:

- There is a clear disparity in the promotion of eco-friendly products and activities (3.81 present vs. 4.13 future).
- The promotion of sustainable transportation has the lowest current competence among the categories, with a notable difference between 3.23 current and 4.04 future.
- There is also space for improvement in biodiversity protection (3.83 present vs. 4.07 future).

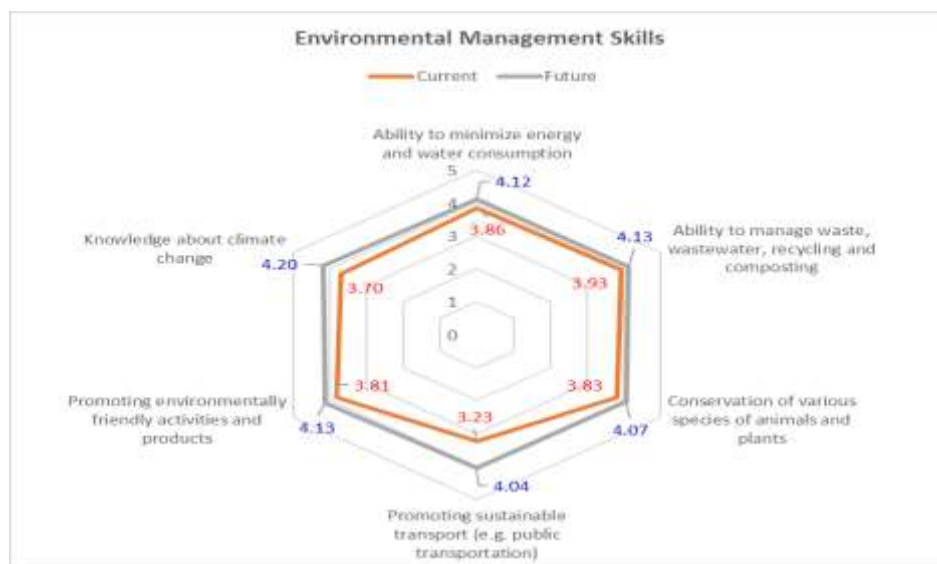


Chart 2. Current and future green skills in tourism and hospitality

The fact that the intended future levels are continuously higher than the existing ones indicates that there is a general desire to raise environmental management proficiency in all domains. Initiatives to support environmentally friendly transportation methods should be the main focus because they exhibit the biggest disparity.

Also enhancing training or awareness initiatives in this field in order to build on the current strength in climate change knowledge. Finally, strengthening initiatives to support biodiversity preservation and eco-friendly products in order to meet future objectives.

Social skills in tourism and hospitality

The orange line in this graphic represents the present level of social skills, while the gray line represents the desired level in the future across a spectrum of social competencies. This is a thorough analysis: The expected strongest skill across all areas, willingness to learn and perform, currently has a score of 4.43 and is expected to reach a desired future level of 4.59. Another strength is creativity, which now has a score of 4.22 with a potential target of 4.48. A strong present capability is demonstrated by fostering a positive work atmosphere (4.38 current vs. 4.52 future).



Chart 3. Current and future social skills in tourism and hospitality

A clear discrepancy between the present and desired problem-solving abilities scores—3.90 versus 4.29—indicates the need for substantial improvement in this area. With a current score of 3.99 and a projected target of 4.41, initiative and involvement also require attention. Additionally, there is space for improvement in customer orientation (4.23 current vs. 4.54 future). Aspirations for improvement are shown in the continuously higher projected future levels across all categories. The biggest disparities are found in initiative and commitment, and problem-solving abilities, indicating that these are priority areas for improvement.

Training programs should be the main focus:

- Usage of problem-solving exercises and seminars to improve decision-making and critical thinking.
- Usage of organized group projects and incentives for participation to promote proactive conduct and activities.
- To achieve the intended future levels of client orientation, offering of trainings on excellent customer service.

Through performance incentives and innovation challenges, keep encouraging creativity and a readiness to learn. Enhance the existing favorable work atmosphere by encouraging teamwork and acknowledgment initiatives.



Chart 4. Current and future communication & cultural skills in tourism and hospitality

Communication and cultural skills are compared between the current level and the necessary future level in the above chart. Currently, the average score is about 4.10, with certain categories having somewhat higher or lower values. Every skill has to be improved, with the average rising to about 4.41.

Although writing and speaking abilities are currently at a respectable level (3.99 for writing and 4.20 for speaking), future advancement is anticipated (4.28 for writing and 4.39 for speaking).

With an expected improvement to 4.48, active listening abilities are currently evaluated at 4.09. The awareness and expression abilities are performing well at the moment (4.00), but they will need to increase to 4.36 in the future. And the same improvements are needed for Knowledge of local traditions, Foreign language, and Intercultural respect.

The necessary adjustments show that improving intercultural and communication skills is a top priority. This implies that in order to successfully meet future expectations, further training or exposure in these areas is required.

Digital skills in tourism and hospitality

A comparison of digital skills across different categories is seen in chart 5. It contrasts the expected or anticipated level of digital abilities for the future (shown by the gray line) with the existing level (shown by the orange line). Each axis on the chart symbolizes a digital skill, and the categories are arranged around it. Here is a breakdown of the key elements:

Significant progress is required in the skills with the biggest gaps, where the gray line is significantly farther away than the orange line. Skills with reduced gaps between the two lines indicate that the present level is getting closer to the target level. Social media management (4.01 current score), Skills in using the operating systems (3.96 current score), and Online marketing and communication skills (3.86 current score) are the strongest current talents.

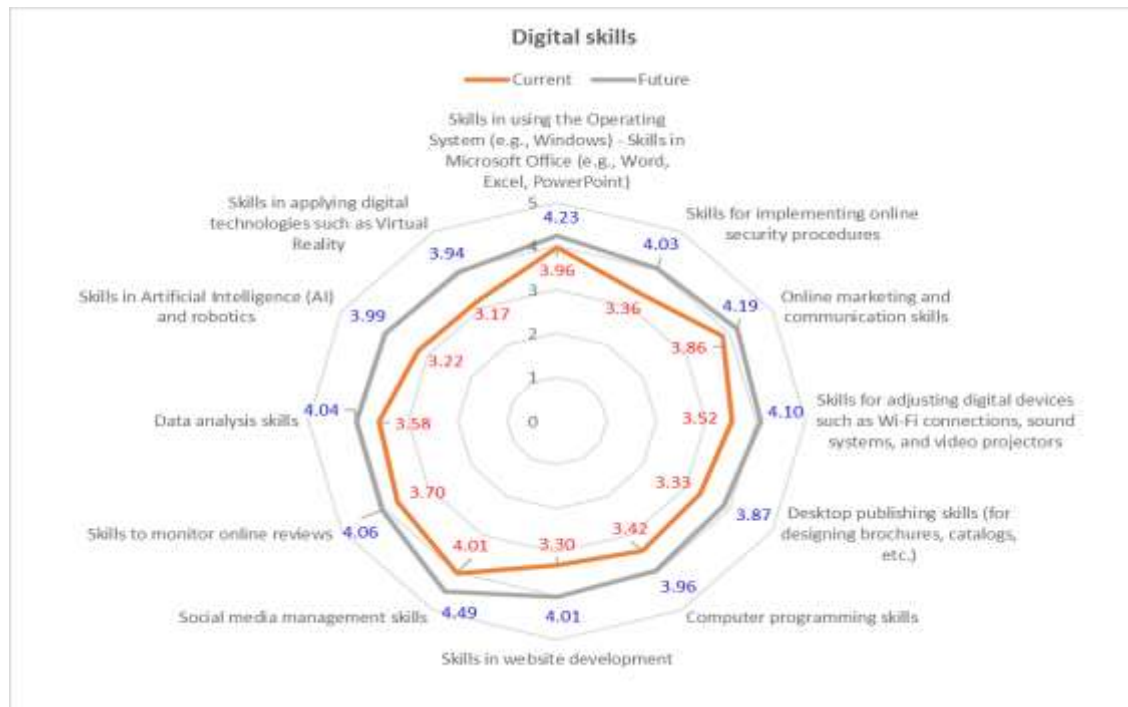


Chart 5. Current and future digital skills in tourism and hospitality

Improvements are required in the following areas:

- Robots and artificial intelligence (AI): present (3.22) versus future (3.99).
- Skills in programming: Present (3.42) versus Future (3.96).
- Online security and safety: present (3.36) against future (4.03).
- Skills in applying digital technologies (e.g. VR): present (3.17) against future (3.94).
- Skills in website development: present (3.30) against future (4.01).

Conclusion & Recommendation

From the viewpoint of the Albanian tourism business, the study outlined the current tourism skills as well as the necessary future skills, trends, and advancements in relation to digital and sustainable skills (green and sociocultural skills).

The intended future levels for green skills in tourism are continuously higher than the existing levels, indicating a general goal to raise environmental management proficiency in all domains. Since this demonstrates the biggest disparity, efforts should be made to encourage environmentally friendly transportation methods.

Also, another aspect is enhancing existing climate change expertise by growing awareness or training initiatives in this field. Last but not least, strengthening initiatives to support biodiversity preservation and eco-friendly goods in order to meet future targets.

Aspirations for improvement are shown in the consistently higher desired future levels across all social skills categories. The areas with the biggest gaps are in initiative, commitment, and problem-solving abilities, indicating that they should be prioritized for improvement.

To achieve the intended future levels of client orientation, training programs that improve critical thinking and decision-making should be prioritized. Proactive behavior and initiatives should be encouraged through organized team projects and prizes for involvement and exceptional customer service.

Writing and speaking abilities, active listening abilities, awareness and expression abilities, familiarity with regional customs, foreign language proficiency, and intercultural respect all require the same enhancements.

The strongest current skills are social media management (4.01 current score), operating system proficiency (3.96 current score), and online marketing and communication skills (3.86 current score). Main improvements are needed accordingly: Robots and artificial intelligence (AI): present (3.22) versus future (3.99); Skills in programming: Present (3.42) versus Future (3.96); Online security and safety: present (3.36) against future (4.03); Skills in applying digital technologies (e.g. VR): present (3.17) against future (3.94); and Skills in website development: present (3.30) against future (4.01).

Among other things, the results demonstrated a notable discrepancy between the current understanding of tourism skills and the future demands for digital and sustainable skills (the latter including socio-cultural and green skills) as seen from the demand side of the tourism industry.

Based on the study's findings, the authors suggested that training programs be put in place to close the knowledge gap between the current and future demands for digital, soft, and green skills in Albania's tourist and hospitality sector.

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Workplace Digital Empathy : Reimagining employee well-being through AI

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Keywords

employees, wellbeing, AI, digital, empathy

Abstract

This paper examines the evolving role of artificial intelligence (AI) in supporting employee well-being through mechanisms of digital empathy. Drawing on qualitative case studies of two global organisations deploying AI-based emotional support systems, the research investigates how employees interpret and interact with these technologies. The study is guided by three core questions: How is empathy simulated through AI in workplace settings? How do employees perceive and experience these systems? What ethical and relational dynamics shape their implementation and impact?

A qualitative multi-case design was adopted, utilising semi-structured interviews with HR professionals and end users (n=22) and document analysis of platform architecture and language models. Findings reveal that while AI systems can provide emotionally responsive feedback, users remain ambivalent about their authenticity and ethical use. Participants valued the immediacy and privacy of AI-based tools but highlighted limitations in nuance, trust, and cultural fit.

Drawing on emotional labour theory and self-determination theory, the paper argues that digital empathy is best conceptualised as a relational interface that complements – rather than replaces – human connection. Organisations must embed these tools within cultures of psychological safety and ethical transparency. The study recommends participatory co-design of well-being technologies and hybrid models of care that preserve emotional authenticity. These insights contribute to emerging debates on AI, care work, and the transformation of human resource management in the algorithmic age.

Introduction

The increasing integration of artificial intelligence into human resource practices has sparked both enthusiasm and concern. Among the most contested areas is the role of AI in promoting or simulating emotional care – what some scholars term “digital empathy.” As organisations seek scalable, always-on solutions to support employee well-being, technologies such as sentiment-analysis tools, affective chatbots, and AI-powered wellness platforms are being rapidly adopted. These tools promise to democratise access to care, reduce stigma, and provide early warning signals for stress and burnout. Yet they also raise critical questions about authenticity, surveillance, and the boundaries of emotional work in digital environments.

Workplace well-being has traditionally been addressed through a mix of managerial practice, human relationships, and organisational culture. The recent shift toward technological mediation reflects broader transformations in work: remote settings, digital overload, and the psychological toll of pandemic-era disruption. At the same time, AI introduces new dynamics of interaction, trust, and data extraction that may both support and undermine care. As Zuboff (2019) and Moore (2018) suggest, surveillance and support often travel in tandem under algorithmic governance.

Theoretical frameworks such as emotional labour theory (Hochschild, 1983) and self-determination theory (Deci & Ryan, 2000) offer useful lenses for interpreting this phenomenon. Emotional labour theory reminds us that care is performed, managed, and often commodified – raising questions about what it means for a machine to perform empathy. Self-determination theory foregrounds autonomy, competence, and relatedness as core psychological needs that any well-being system must support. The challenge, then, is not simply whether AI can mimic care, but whether it can meaningfully enable these human needs in practice.

This paper focuses on the lived experiences of employees and HR professionals who interact with AI-based well-being systems. It asks:

- How is empathy simulated or presented through AI in workplace well-being platforms?
- How do employees perceive and respond to these systems?
- What ethical, emotional, and organisational factors influence their acceptance or resistance?

The objectives of this study are threefold:

1. To explore how digital empathy is technically and linguistically constructed in AI systems.
2. To examine user experiences and concerns regarding AI-enabled emotional support.
3. To evaluate the broader ethical and relational implications of embedding such systems in organisational life.

By addressing these questions, the study contributes to a growing body of research on the role of AI in reshaping affective labour and employee care. It provides empirical insight into how AI-based well-being tools function in practice and offers guidance for more humane, ethical, and psychologically grounded implementation.

Theoretical Foundations of Employee Well-being

Employee well-being has long been conceptualised as a multidimensional construct encompassing psychological, emotional, and social dimensions (Danna & Griffin, 1999; Warr, 2007). The Job Demands-Resources (JD-R) model, proposed by Demerouti et al. (2001), provides a critical framework for understanding the conditions under which employees thrive or experience burnout. According to the JD-R model, job resources such as social support, autonomy, and feedback buffer the impact of job demands and enhance engagement and well-being. Within AI-mediated environments, these job resources can be replicated or augmented, offering novel avenues for intervention but also creating tensions in terms of authenticity and relational depth.

Self-Determination Theory (SDT), introduced by Deci and Ryan (2000), offers further insight into how well-being is sustained in the workplace. SDT posits that three basic psychological needs—autonomy, competence, and relatedness—are essential for motivation and flourishing. AI-based systems that provide feedback, encouragement, or emotion-tracking tools must be assessed for their ability to reinforce or undermine these needs. While AI can offer personalised responses that promote perceived competence or reduce emotional strain, it may also inadvertently reduce autonomy if implemented in a controlling or opaque manner (van den Broeck et al., 2016).

Employee Well-being and Organisational Outcomes

The link between employee well-being and organisational performance has been well-established. Meta-analyses by Harter et al. (2002) and Bakker & Demerouti (2008) show that high levels of employee well-being correlate with lower turnover, higher productivity, and greater customer satisfaction. Well-being is not merely a moral or ethical imperative but a strategic one. Digital systems that promote emotional self-awareness, stress management, and social support may enhance these outcomes, provided they are designed and implemented thoughtfully.

However, the literature warns that well-being initiatives may become instrumentalised, serving employer interests more than those of employees (Miller & Rose, 2008). In AI-supported systems, this risk is magnified. Algorithms may be deployed under the guise of care while functioning as surveillance tools. As Moore (2018) and Zuboff (2019) argue, the line between support and surveillance is thin, especially when emotional data is repurposed for performance evaluation or predictive analytics. Thus, any attempt to evaluate AI in the realm of well-being must contend with these dual potentials.

Digital Empathy: Definition and Evolution

The term "digital empathy" has emerged to describe the simulation or facilitation of empathetic interactions through technological means. Initially developed within affective computing (Picard, 1997), the idea of machines recognising and responding to human emotion has expanded to include chatbots, virtual agents, and emotion-aware AI systems. These tools employ natural language processing, sentiment analysis, and biometric data to mirror or respond to emotional states (McStay, 2018).

Despite promising developments, the notion of empathy without consciousness remains controversial. Coeckelbergh (2020) distinguishes between "empathy as simulation" and "empathy as moral responsiveness," arguing that AI can mimic but not internalise emotions. As such, digital empathy remains a performative construct—useful in guiding interaction, yet limited in its capacity to replace genuine human engagement. This tension is central to debates in HRM and organisational ethics.

Criticism and Challenges in AI-mediated Care

Several critiques have been raised regarding the efficacy and ethics of AI-supported well-being interventions. First, there is concern over emotional reductionism—the simplification of complex emotional states into binary or categorical variables. Such simplification risks excluding cultural nuance and lived complexity from the domain of digital care (Crawford, 2021). Second, there are data privacy concerns. Emotional data, once collected, becomes a form of biometric information with significant ethical implications (Ajunwa et al., 2017).

Additionally, trust in digital systems is often fragile. Research by Mittelstadt et al. (2016) and Calvo et al. (2019) underscores the importance of transparency and user agency in AI design. Where users understand how their data is used, and retain the option to opt-out or customise features, trust and engagement tend to be higher. Where systems are opaque, automated, or imposed without consultation, employee resistance is likely.

Toward a Relational Understanding of Digital Empathy

The emerging literature suggests that the most promising applications of AI in well-being are those embedded within broader relational and organisational frameworks. Rather than replace human empathy, these tools should augment existing practices of care, serving as emotional prompts, reflective aids, or support triggers. Calvo & D'Mello (2010) advocate for "positive computing," a design paradigm that places human flourishing at the centre of technological innovation. Similarly, Held (2006) and Tronto (2013) propose ethics-of-care frameworks that prioritise relational sensitivity, trust, and mutual responsibility.

This relational turn in digital empathy literature aligns with the view that well-being technologies are not neutral tools but social artefacts. Their meaning and effectiveness depend on context, implementation, and the values embedded within their design. By analysing how AI-supported empathy is experienced within organisations, this study seeks to contribute a grounded understanding of both its potentials and its limits.

AI Contributions to Performance, Satisfaction, and Commitment

Recent research highlights that AI integration in HR practices can significantly improve employee performance, job satisfaction, and organisational commitment. AI-enabled systems automate routine tasks, enabling employees to focus on creative, strategic, and interpersonal activities—boosting both efficiency and motivation (Jarrahi, 2018). Furthermore, real-time feedback, adaptive training, and personalised digital coaching have been shown to enhance perceived fairness, role clarity, and opportunities for growth (Brougham & Haar, 2018). These outcomes contribute to increased job satisfaction and a deeper sense of commitment to organisational values and goals.

Studies such as those by IBM (2021) and Gallup (2022) also indicate that AI tools, when integrated into performance management systems, promote objectivity and reduce bias. This enhances employee trust in evaluation processes, reinforcing psychological contracts and lowering turnover intentions.

Challenges and Impact Factors in AI-Supported Well-being

Despite these benefits, a number of challenges hinder the full realisation of AI's potential in well-being initiatives. Technological literacy remains uneven, especially across age, region, and industry sectors, creating adoption gaps. Moreover, trust in AI systems is fragile—particularly where data collection is perceived as intrusive or lacking transparency (Ajunwa et al., 2017; Crawford, 2021). Organisational culture plays a decisive role: in environments where surveillance or micromanagement is prevalent, even well-intentioned AI tools may be viewed as coercive rather than supportive.

Impact factors that shape AI effectiveness include managerial endorsement, user training, the perceived value of tools, and alignment with existing support systems. Without proactive engagement and communication strategies, organisations risk low adoption and resistance.

Strategies for Overcoming Implementation Barriers

To ensure AI-supported well-being tools are effective and ethical, scholars recommend participatory and co-design models (Calvo et al., 2019). Involving employees in the design, testing, and feedback stages fosters relevance, trust, and ownership. Ethical AI frameworks—such as explainability, opt-in/opt-out mechanisms, and privacy-by-design—are essential to guard against misuse.

Hybrid approaches are particularly successful: digital tools that provide continuous support are best complemented by human follow-up, maintaining empathy and trust while benefiting from AI's scale. Finally, continuous monitoring and adjustment of AI systems based on user experience data help sustain relevance and mitigate emerging risks.

Organisational Behaviour Dimensions in Digital Empathy Implementation

While employee well-being is central, it must also be understood within a broader organisational behaviour (OB) context. Organisational behaviour theories, particularly those related to trust, leadership, organisational culture, and psychological contract theory, are critical in shaping the success of digital empathy implementation. Trust in leadership and organisational systems has consistently been found to influence employees' openness to new technologies and well-being initiatives (Edmondson, 1999; Mayer et al., 1995). Leaders act as sense-givers, shaping whether employees see AI as empowering or controlling. Transformational leadership in particular fosters the psychological safety necessary for engaging with emotionally intelligent technologies (Bass, 1990).

Moreover, organisational citizenship behaviour (OCB) literature suggests that employee engagement with empathy tools may spill over into prosocial behaviour, such as peer support or cooperative effort (Organ, 1988). The relational culture of an organisation, including its practices of inclusiveness, voice, and support, determines whether employees interpret AI as aligned with or antagonistic to shared values. Social exchange theory (Blau, 1964) also becomes relevant: employees who feel supported are more likely to reciprocate with commitment and discretionary effort, reinforcing the intended outcomes of digital empathy systems.

Employee Reactions and Cultural Resistance to Algorithmic Tools

An emerging body of research warns of cultural dissonance between AI's logic and the lived norms of organisational communities. As Zuboff (2019) notes, algorithmic systems introduce a shift from relational to informational interaction, which may jar with organisations grounded in trust-based or relational traditions. Cultural intelligence (Earley & Ang, 2003) becomes crucial—not only for international contexts, but also for organisational subcultures where norms around emotion, support, and privacy differ.

Resistance can also stem from power dynamics. If employees suspect that AI data will be used for managerial control rather than care, they may disengage or actively sabotage system use (Miller & Rose, 2008). These findings resonate with studies on technostress (Ayyagari et al., 2011), which highlight that ambiguous role expectations and surveillance-heavy tools erode perceived well-being, regardless of technological intent.

Relational and Ethical Implications: The Moral Function of Empathy

The ethics-of-care framework (Held, 2006; Tronto, 2013) provides a moral lens to assess AI systems in HRM. Empathy is not merely an emotional state but a moral commitment to relationality. Technologies that simulate care without accountability risk producing "moral detachment," where superficial comfort replaces actual responsibility for employee welfare. Tronto's (2013) model emphasises attentiveness, responsibility, competence, responsiveness, and trust—criteria that digital empathy systems often struggle to meet in full.

However, some systems are improving. Participatory AI design and culturally responsive programming are closing gaps in responsiveness and moral contextualisation (Calvo et al., 2019). In these cases, AI acts less like a surrogate and more like an infrastructural scaffold supporting ethical care practices.

Methodology

This study employed a qualitative case study approach to explore how AI-supported digital empathy tools are experienced in the workplace and how they influence employee well-being. The decision to adopt a case study design was based on its suitability for examining complex, real-world phenomena in depth and within context (Yin, 2018). The methodology sought to generate rich, interpretive data about perceptions, attitudes, and the relational dynamics between AI systems and human users in organisational settings.

Research Design and Sampling

Two multinational organisations in the technology and finance sectors were selected based on their use of AI-driven platforms designed to support employee well-being. Purposeful sampling was used to select participants who had direct experience interacting with these systems, including AI-powered chatbots, mood trackers, and digital feedback mechanisms. A total of 20 semi-structured interviews were conducted – 10 participants from each organisation – representing a mix of employees, team leaders, and HR professionals.

Data Collection

Data were collected through in-depth, semi-structured interviews lasting 45–60 minutes. The interview protocol covered themes such as perceived usefulness of the AI tools, emotional resonance, trust, ethical concerns, and perceived impact on well-being and workplace relationships. Interviews were conducted online, recorded with participant consent, and transcribed verbatim. An anonymised demographic questionnaire was also administered to capture contextual information (e.g. role, tenure, digital literacy).

Data Analysis

Thematic analysis was conducted following Braun and Clarke's (2006) six-phase process: familiarisation, coding, theme development, reviewing, defining, and writing up. NVivo software was used to organise and code the transcripts. Themes were derived inductively, with constant comparison techniques used to identify cross-case patterns and divergences. Particular attention was given to narratives that reflected ethical tensions, psychological outcomes, and perceptions of authenticity or emotional connection.

Ethical Considerations

The study received ethical approval from the host university's research ethics board. Participants provided informed consent and were assured of anonymity and confidentiality. Data were securely stored and encrypted. Reflexivity was maintained throughout the study to acknowledge the positionality of the researchers and to ensure sensitivity to emotional and organisational power dynamics.

By combining methodological rigour with contextual sensitivity, this qualitative inquiry offers grounded insights into how digital empathy is shaping the experience of well-being at work.

Findings

Analysis of the interview data revealed four major themes concerning the use of AI-supported digital empathy tools in the workplace. These themes reflect both the perceived benefits and the limitations of these technologies, and provide insight into how employees experience AI's role in fostering well-being.

Enhanced Accessibility and Psychological Safety

Participants widely reported that AI systems enhanced their access to mental health support and well-being resources. Employees described digital interfaces – particularly AI-powered chatbots and emotion-tracking dashboards – as “non-judgmental,” allowing them to share concerns they might hesitate to raise with a human supervisor. Several interviewees highlighted that the anonymity of AI interactions reduced stigma and made it easier to seek help. A middle manager in the finance sector commented, “I’d rather speak to the bot sometimes because I don’t want to seem weak to my team.” This suggests that AI systems may provide a psychological buffer in high-pressure environments.

Mixed Perceptions of Authenticity and Connection

While many participants appreciated the availability and consistency of AI responses, others questioned the depth and authenticity of digital empathy. Some employees viewed AI interactions as scripted and impersonal, particularly when responses seemed generic. A recurring theme was that AI

tools were good for “surface-level” support but could not substitute for genuine human interaction. This aligns with concerns in the literature about simulated empathy lacking the emotional depth and moral responsiveness associated with human care (Coeckelbergh, 2020).

Perceived Impact on Well-being and Job Satisfaction

Participants generally acknowledged that AI tools contributed positively to their emotional awareness and stress management. Daily mood tracking features, automated well-being prompts, and cognitive behavioural micro-interventions were cited as particularly useful. In some cases, employees linked these tools to increased job satisfaction, noting that they felt “noticed” and “supported,” even if by a machine. However, these benefits were conditional on the perception that the organisation genuinely prioritised well-being and was not using AI as a superficial or performative gesture.

Trust, Transparency, and Organisational Alignment

Trust emerged as a crucial factor shaping user engagement with digital empathy systems. Participants expressed concern about how emotional data was stored and used. Many were unaware of data governance protocols, leading to anxiety about surveillance. Trust was higher in organisations that communicated openly about the purpose and limits of AI systems and offered opt-in choices. A technology sector respondent stated, “It works because they told us exactly what it’s for, and we control what we share.”

These findings illustrate that the impact of AI on employee well-being is not merely a function of technological capability, but of implementation context, cultural alignment, and ethical clarity. In the discussion that follows, these results are interpreted in light of existing theory and empirical literature.

Discussion

This study set out to examine how AI-mediated digital empathy tools affect employee well-being in the workplace. The primary research questions addressed were: (1) How do employees experience digital empathy systems at work? (2) What are the perceived benefits and limitations of these AI-supported tools for emotional support? (3) What organisational and cultural factors influence their effectiveness? The findings reveal a nuanced picture, showing that digital empathy is both a promising and contested development in employee well-being strategies.

Digital Empathy as a Supplementary Support System

The first research question sought to understand how employees experience digital empathy tools in daily work contexts. Consistent with literature on positive computing (Calvo & Peters, 2014), interviewees described AI-powered chatbots, sentiment analysis dashboards, and feedback mechanisms as valuable non-intrusive channels for checking in emotionally. These tools provided perceived immediacy and neutrality—particularly in high-pressure or stigma-prone environments. This confirms earlier findings from McStay (2018), who suggested that digital technologies may expand psychological safety through private, self-regulated forms of interaction. The findings also align with Kluemper et al. (2019), who found that employees were more likely to use AI systems for mental wellness when human alternatives felt unavailable or unsafe.

The analysis addressed the research questions and illuminated how digital empathy tools are reshaped by, and reshape, organisational dynamics.

RQ1: How do employees experience digital empathy systems at work?

Digital empathy systems were experienced as contextually dependent. Where relational safety and ethical transparency existed, employees valued them for offering emotional calibration and access to support. These tools acted as affective buffers, particularly in roles involving high cognitive or emotional strain.

RQ2: What are the perceived benefits and limitations of these AI-supported tools for emotional support?

The primary benefits were accessibility, consistency, and reflective feedback. However, the limitations—lack of moral responsiveness, superficial interaction—stemmed from the tools’ inability to

fully simulate affective nuance. Emotional support was only sustainable when paired with organisational commitment to holistic care.

RQ3: What organisational and cultural factors influence their effectiveness?

Leadership tone, ethical governance, and participatory implementation were decisive. Organisations that embedded AI within a care culture—characterised by voice, agency, and clear communication—achieved better outcomes. Theoretical frameworks from psychological safety (Edmondson, 1999) and moral design (Tronto, 2013) help explain these effects.

Limitations of Simulated Empathy and Emotional Authenticity

However, responses to the second research question—concerning perceived limitations—highlighted key concerns about emotional authenticity. Coeckelbergh (2020) argues that while AI systems may simulate empathetic interaction, they cannot engage in genuine emotional reciprocity. This was reflected in participant narratives, where several users described AI tools as “robotic” or “formulaic,” especially when offering generic responses. These views mirror results from Picard (1997) and Mittelstadt et al. (2016), who raised concerns over emotional reductionism and scripted care. The study also reaffirms Moravec’s (2021) critique that simulated empathy may satisfy superficial engagement but risks alienating users when depth is needed, particularly in crises or complex emotional moments.

Conditional Benefits: Performance, Satisfaction, and Well-being

In addressing the impact on performance and satisfaction, the findings showed clear support for the third objective: evaluating AI’s influence on psychological outcomes. Participants acknowledged improvements in self-awareness and emotional regulation—particularly through mood tracking and micro-intervention prompts. This resonates with Bakker and Demerouti’s (2008) Job Demands-Resources model, where technology serves as a job resource mitigating emotional demands. Employees linked consistent emotional check-ins with improved task focus and reduced stress, contributing to a more engaged and satisfied work experience. Studies by Jarrahi (2018) and Tritt et al. (2019) support this view, noting that AI-driven feedback increases clarity and perceived fairness in work evaluation, thereby enhancing job satisfaction.

Yet these effects were not universally experienced. According to Self-Determination Theory (Deci & Ryan, 2000), employee well-being is maximised when autonomy, relatedness, and competence are supported. AI systems that imposed rigid routines or used opaque feedback mechanisms were experienced as invasive or manipulative, dampening motivation. This variation underscores the literature’s emphasis on design quality and contextual relevance (Calvo et al., 2019).

Trust and Ethical Transparency: Critical Enablers of Engagement

Trust emerged as a critical theme in response to the third research question regarding contextual and organisational factors. Echoing the work of Ajunwa et al. (2017) and Jobin et al. (2019), the study found that user trust depended on clarity regarding data usage, storage, and opt-in options. Transparent communication by employers increased engagement and reduced suspicion. In organisations where data policies were ambiguous, employees hesitated to use even beneficial features. This finding supports Edmondson’s (1999) work on psychological safety and builds on Mittelstadt et al. (2016), who argue that trustworthy AI requires both technical and relational transparency.

Cultural Alignment and Leadership Support

Finally, cultural alignment played a vital role. In line with Sull & Sull (2022), the study found that AI tools were more successful in organisations where leaders demonstrated visible support for employee well-being and where communication was open and participatory. Leadership modelling, opt-in freedom, and feedback channels all contributed to better uptake. Conversely, in hierarchical or surveillance-oriented cultures, digital empathy tools often triggered anxiety or disengagement. These findings suggest that empathy-related technology must be framed within a human-centred organisational ethos.

Addressing the Research Objectives

The research objectives were clearly met. Objective 1—to document how employees experience digital empathy—was achieved through qualitative narratives illustrating both appreciation and

skepticism. Objective 2—evaluating the impact on employee well-being—was addressed through evidence of enhanced emotional regulation, psychological safety, and conditional satisfaction. Objective 3—examining cultural and ethical implementation factors—was satisfied through rich descriptions of the trust, communication, and leadership dynamics that shape AI acceptance.

This study contributes to a growing literature that situates AI not as a neutral tool but as a relational and cultural actor. The evidence supports hybrid human-AI frameworks where digital systems enhance, but do not replace, emotional labour and organisational care structures. Further research should explore longitudinal impacts, cross-cultural variations, and ethical design practices that foreground employee agency.

In conclusion, while digital empathy offers transformative potential, its effectiveness relies on context-sensitive design, organisational trust, and ethical clarity. When implemented with attention to relational dynamics, AI can genuinely support the evolving landscape of employee well-being.

Conclusion

This study explored the role of AI-mediated digital empathy tools in enhancing employee well-being. By drawing on case study data from two multinational organisations, it was possible to unpack the lived experiences of employees engaging with these systems and to critically evaluate the extent to which AI contributes to emotional support and workplace flourishing. The findings suggest that AI-supported tools offer meaningful benefits—such as accessibility, psychological safety, and enhanced self-awareness—particularly when implemented transparently and within supportive organisational cultures.

However, digital empathy remains a complex and contested domain. While the tools may replicate surface-level empathetic interaction, they lack the depth of human emotional engagement. Moreover, the success of these systems is conditional upon ethical clarity, voluntary use, trust, and cultural alignment. In essence, AI should be viewed not as a substitute for human care, but as a complementary resource within a broader well-being ecosystem.

Recommendations for Practice

1. **Adopt Hybrid Models:** Organisations should combine AI-supported systems with human follow-up to balance scalability with authenticity. Digital tools can initiate support, but human actors are crucial for sustained emotional engagement.
2. **Ensure Ethical Transparency:** Clearly communicate how emotional data is collected, stored, and used. Provide opt-in mechanisms and ensure that data privacy policies are accessible and understandable.
3. **Promote Participatory Design:** Involve employees in the development, testing, and refinement of digital well-being tools to increase trust, relevance, and adoption.
4. **Cultivate Supportive Cultures:** Leaders should model empathy, encourage open communication, and frame AI tools as supportive rather than supervisory.

8. Recommendations for Future Research

1. **Longitudinal Studies:** Future research should examine the long-term effects of digital empathy systems on well-being, burnout, and organisational outcomes across different sectors.
2. **Cross-Cultural Comparisons:** Investigate how digital empathy tools are received in various cultural contexts to determine the influence of cultural values on trust and emotional engagement.
3. **Comparative Evaluations:** Compare employee outcomes across organisations using different AI strategies to evaluate which design and implementation practices are most effective.
4. **Ethical Governance Models:** Explore the development and impact of ethical AI oversight structures on employee perception, organisational legitimacy, and system effectiveness.

By continuing to explore these avenues, researchers and practitioners can more effectively integrate AI tools into strategies for supporting human well-being in increasingly digital workplaces.

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Appendix A: Sample Interview Questions

1. How often do you interact with the digital well-being or AI support systems at your organisation?
2. What features or tools have you used (e.g., chatbots, emotional check-ins, mood trackers)?
3. How would you describe your experience with these tools in terms of usefulness and emotional relevance?
4. Have you experienced any changes in your stress levels, satisfaction, or performance as a result of using these tools?
5. What concerns do you have about how your emotional or personal data are being used?
6. In what ways does your organisation promote or support the use of these systems?
7. Would you prefer these tools to be combined with human interaction, or used independently? Why?

Appendix B: Participant Demographics Overview

Attribute	Group 1 (Finance)	Group 2 (Tech)
Total Participants	10	10
Gender (M/F/Other)	6/3/1	5/5/0
Average Age (years)	36	32
Roles	Analysts, HR, Managers	Developers, UX, HR
Tenure (avg. in years)	4.5	3.2
Prior AI Exposure	Moderate	High
Digital Literacy	Medium	High

Revisiting Small and medium enterprises development challenges in the Democratic Republic of Congo: The relevance of government support, financial access, ICT adoption, and management competency

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Keywords

Government support, Financial access, ICT adoption, and Management Competency, Small and Medium Enterprises: The Democratic Republic of Congo

Abstract

This study reviews the role of government support, financial access, ICT adoption, and management competency in developing SMEs in DR Congo. The study employed a quantitative approach using a sample of 177 SMEs located in the country's selected regions (Lubumbashi, Kolwezi and Kinshasa). Findings from the study revealed the importance of strengthening ICT adoption and management competency of SMEs in the selected region. As for government support and financial access, the study's conclusions showed a need to review their various interventions to ensure they meet their intended purpose: to support SME development. These findings suggest that to develop SMEs further, all parties involved in their management should devise plans to increase the usage of ICT and offer training to improve their management skills.

Background and Introduction

The foundation of any robust economy is made up of Small and Medium-sized businesses (SMEs), which are crucial to the development and prosperity of nations (Endris & Kassegn, 2022). More importantly, a thriving SME sector may help African economies, which are experiencing historically poor growth rates, improve employment, alleviate poverty, and innovate in technology (Endris & Kassegn, 2022).

The DR-Congo is the continent's second-largest nation in central Africa, behind Algeria. It is also the fourth most populated country behind Nigeria, Ethiopia, and Egypt, and is four times the size of France. The DR-Congo has an area of 2,345,410 Km². It has 26 provinces and a population estimated to be between 98.3 million and over 100 million, of which 44% reside in urban areas. According to estimates, 77.2% of people in the DR-Congo lived below the poverty line (less than \$1.9 per day) in 2010; by 2022, that number had dropped to 73.1%. Nonetheless, its poverty rate remains among the highest globally (Agarwal, 2022; Kuka, Oh & Song, 2021). According to the World Bank, more than 90% of the nation's SMEs are tiny, employing one to nine people, and about half have been in business for less than five years. Informal SMEs make up the majority of the DR-Congo's SME sector, according to the World Bank (2019). DR-Congo's informal economy is expected to account for 47% of GDP, which is more than the 40% of other unstable peer nations and about 36% of sub-Saharan Africa. According to Kamba (2016), SMEs in the DR-Congo employ two out of every three workers. This suggests that SMEs account for at least 80% of economic activity that generates revenue. The SME sector accounts for at least 80% of jobs in Kinshasa, the capital city, making it the largest employer.

DR-Congo SMEs have many obstacles. As an example, a study by Woldie et al. (2018) found that SMEs in the Democratic Republic of Congo face significant challenges in accessing finance, securing loans due to high poverty levels, and maintaining an adequate regulatory environment. Corruption and bribery, along with taxation and lack of infrastructure, further exacerbate these issues, affecting the overall business environment. Nongolola's 2020 study on SMEs' performance in Kinshasa, DR-Congo, found that political and legal factors are crucial for survival and sustainability, while economic, technological, and social factors were less important. Sadiki Mutarushwa, Vwima, and Lebailly (2020) found that SMEs in the South-Kivu province of the DR- Congo face challenges such as lack of access to finance, electricity, load-shedding, corruption, bribery, and lack of basic infrastructure, equipment, and management skills, which

hinder their growth. Lipoko et al. (2021) studied SMEs in Kinshasa, DR-Congo, highlighting challenges such as lack of government support, family influence, and political instability. They found that families encourage youths to seek jobs, while the government struggles to create a conducive environment for SMEs. The results of earlier research on SMEs in the DR-Congo have brought to light important issues, necessitating further investigation into how managerial skill, financial access, ICT use, and government support affect SMEs in selected regions of the country.

Based on the above research background, the following research question were formulated:

Primary question: To what extent does government support, financial access, ICT adoption and management competency affect SMEs in the DR-Congo?

The Resource-based view theory (RBV) as a lens of the study

According to Krusi and Bazelmans (2022), the resource-based view theory (RBV) identifies the key resources that an organization might utilize to gain a sustained competitive advantage. The RBV theory is concerned with "why firms are different and how firms could gain sustainability and competitive advantage by the efficient deployment of its available resources" (Maiti, Krakovich, Shams Riad & Vukovic, 2020:1526).

The Resource-Based View (RBV) theory, which emphasizes how internal resources and capabilities influence business performance and competitiveness, is pertinent to this subject. SMEs in the DR-Congo must obtain and utilize government support, financial resources, ICT adoption, and management competencies in order to overcome environmental obstacles, boost productivity, and accomplish sustainable growth. How these resources assist create a competitive edge in a challenging business environment like the DR-Congo is explained by the RBV.

Literature Review

Government support

Support from the government is essential for SMEs because it allows them to access limited resources and helps them grow as startups to establish a stable position in a volatile market. Government support guarantees SMEs' long-term survival and viability while boosting their profitability (Alkahtani et al., 2020). Government support refers to tools like laws, rules, development policies, and potential funding for the growth of the SME sector (Alkahtani, Nordin & Khan, 2020). The government offers SMEs a variety of support schemes that fall into two categories: financial and non-financial. Non-financial support includes information technology, grants, loans, social assistance, tax allowances, and productivity support. Financial support includes working cash, grants, loans for real estate, and other forms of help. According to Nordin, Hussain, Hasin, Rahim, and Alias (2022), non-financial assistance given to SMEs can be divided into three groups: operational skills, managerial aptitude, and financial advice. The aforementioned categories primarily cover a range of activities, including advice, relaunch initiatives, training, business model evaluation, general assistance, instruction, and information sharing (Nordin et al., 2022). Working capital, grants, real estate loans, and other forms of help are all considered financial support (Arshad, Ahmad, Ali, Khan & Arshad, 2020).

Based on the aforementioned explanations of the "Government Support" concept, Kumar and Singh (2023) provided examples of the many kinds of programs and goals available to SMEs. (Figure 1).

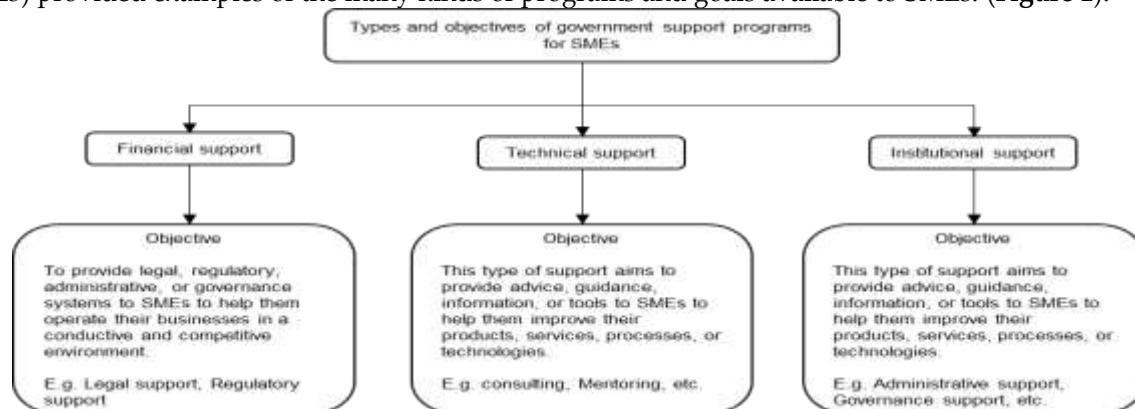


*Figure 1: Types and objectives of various government support***Source:** Kumar and Singh (2023)

The DR-Congo offers two types of support for SMEs: other private support structures and government support structures (Lokonde, 2022). Various strategies are in place to strengthen the SME sector. These strategies include the following:

1. establishing a government ministry specifically focused on SMEs, presently called the "Ministry of Entrepreneurship and Small and Medium-sized Enterprises": 2018 saw this recently created federal agency launch. Its primary focus is helping new and established businesses with regulatory restrictions, capital access, training, and assistance. E
2. he National Agency for the Development of Congolese Entrepreneurship (ANADEC). This office operates under the supervision of the Minister of Entrepreneurship and Small Business. It offers SMEs technical know-how in several fields, including coaching, consultancy, training, and incubation or mentorship. Its five primary areas of interest are agro-pastoral, processing, crafts, services, and small commerce. T
3. mplementing a national SME strategy: The DR-Congo government has implemented national strategies to support the SME sector. The plan was mainly designed to ensure the competitiveness of SMEs and formalise thousands of informal businesses operating in the country. I
4. he creation of a support Project for the Development of Micro, Small and Medium-sized Enterprises (PADMPME): As part of the implementation of the national SME development strategy, in 2016, the Government of the DR-Congo set up another initiative called the "Support Project for the Development of Micro, Small and Medium-sized Enterprises" (PADMPME). It is a joint initiative with the World Bank for \$100 million US dollars. This initiative aims to support the growth of SMEs in the DR-Congo and strengthen their resilience in a turbulent business environment. T
5. he creation of an office called "Guarantee Fund for Entrepreneurship in the DR-Congo" (FOGEC): FOGEC was created in 2020 to promote entrepreneurship amongst the youth population. This government institution was created to provide technical and financial assistance to business startups, small-sized businesses and medium-sized businesses. T
6. rivate sector support institutions include the National Federation of Congolese Companies (FEC) and the Confederation of Congolese Small and Medium-sized Enterprises (COPEMECO). The two institutions were created to protect the interests of the private sector and SMEs. P

Apart from the government institutions listed above, the SME sector is regulated by small business charters. The charter guides the definition of SMEs and other regulations in the industry.

Moreover, in 2017, a law was passed in parliament to regulate subcontracting in the private sector, aiming to strengthen Congolese SMEs by establishing rules and defining subcontracting as consensual, onerous, and written. According to this legislation, all subcontracting activities in the DR-Congo should be reserved only for businesses owned by Congolese people, regardless of their legal form, but should have their head office in any city of the DR-Congo (Lokonde, 2022:156).

To sum up, the DR-Congo has several government assistance programs, both new and old, that are designed to assist SMEs. However, the actual effectiveness of these programs is still unknown. Many individuals wonder if they provide long-lasting effects and satisfy the needs of small enterprises.

Financial Access

Financial access can be defined as "the capacity of the enterprise to acquire financial services, which comprises insurance, payments, credit, deposit and other services connected to risk management" (Rajamani et al., 2022:74). Several factors should be taken into account when determining financial access;

These standards have been demonstrated to be applied globally. These requirements include having a bank account for the particular firm, having access to financial services, being able to use those services effectively, having access to credit, and obtaining loans from financial institutions at reasonable and competitive rates. More than 40% of SMEs in developing nations have at least somewhat restricted access to outside capital, and 20% face severe restrictions, according to Brixiová, Kangoye, and Yogo (2020).

The Central Bank of Congo and several microfinance organisations oversee the financial industry in the DR Congo. There are roughly nineteen commercial banks: eleven are small, six are medium-sized, and three are major. Banks consist of Access Bank, Standard Bank, and Equity Bank, to name a few. There are also 98 microfinance organisations. According to Hunguana, Fall, Lartes, Goases, and Gwarinda (2020), the DR-Congo was ranked 152 out of 190 countries for easy access to credit and 184 out of 190 economies for ease of doing business.

Since banking institutions were seen as hazardous and they lacked collateral, SMEs primarily used personal savings from friends or family to fund their start-ups.

Furthermore, Woldie et al. (2018) noted that some SMEs used their inheritances to finance their operations. However, this is severely constrained because only a small percentage of Congolese can inherit something valuable to serve as collateral, while the majority live below the poverty line. Due primarily to the requirement for more information asymmetry, an indefinite percentage of the population obtains financial services through formal financial organisations. Furthermore, most SMEs who asked for loans had their applications denied, according to Woldie et al. (2018), either because they required additional security or collateral. Another problem that affected SMEs' capacity to secure loans from financial institutions was the absence of financial accounts, according to Woldie et al. (2018). Another issue mentioned by SME owners was high interest rates. Finally, Woldie et al. (2018) discovered no proportional relationship between SMEs' loan payback and firm expansion. Thus, this circumstance represents a significant roadblock to the growth of SMEs in the DR Congo.

In the DR-Congo, just 25.8% of adult males and 24% of females had access to a bank account, according to Hunguana et al. (2020). All told, these figures correspond to about 10 million bank accounts. **Figure 2** depicts the financial inclusion by gender in DR-Congo, which is the percentage of the population with access to a bank account. As may be observed, "Banked" refers to those who currently hold an account with a commercial bank. "Other formal" comprises regulated businesses like mobile phone companies or microfinance institutions, while "Informal" denotes the proportion of people who keep their money in savings clubs or community-based projects.



Figure 2: Gender/ bank and financial services accessibility (male vs female) in DR-Congo

Source: Hunguana et al. (2020)

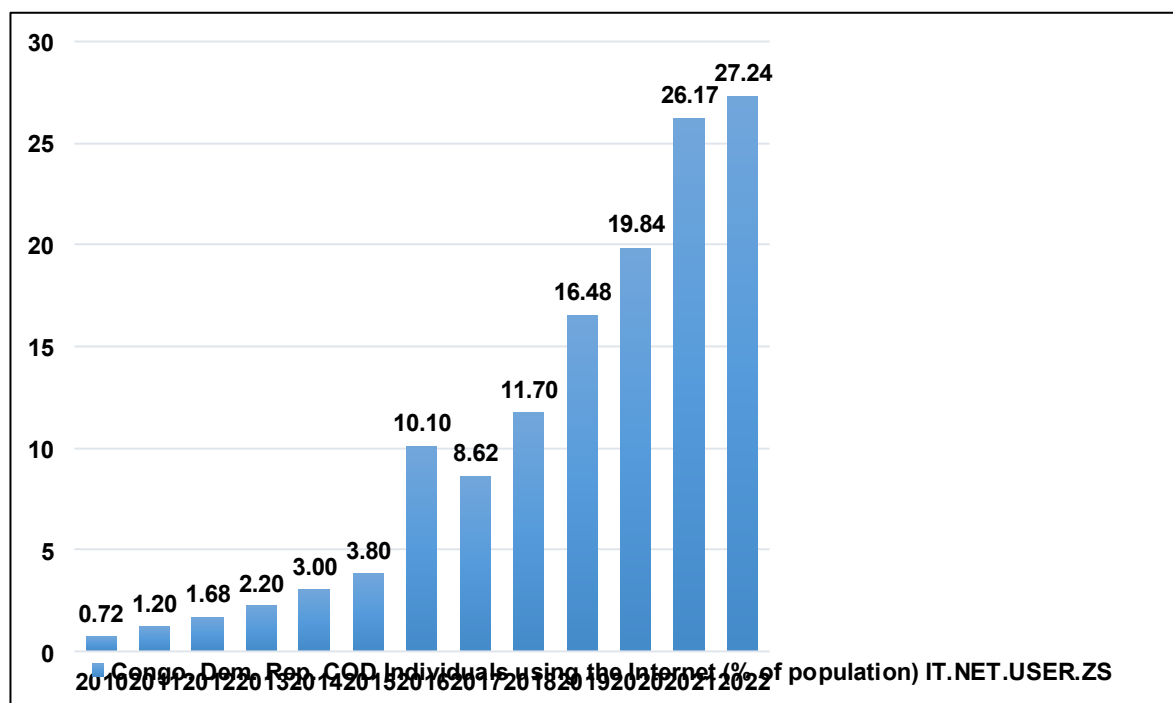
ICT adoption

Kusumaningtyas and Suwanto (2015:297) state that ICT adoption refers to the "willingness to take the new innovation-related computers and Internet". (ICT) Refer to "capabilities offered to organisations by computers, software applications and telecommunications to deliver data, information and knowledge to

individuals and processes". It covers a wide range of products and services, including, but not limited to, computers, the Internet, mobile phones, managed services, and corporate software. Conversely, ICT infrastructure describes the networks, systems, or services that make it easier for ICT to operate and process (Audu, 2018). Chege et al. (2019) asserted that SMEs can benefit from ICT. These benefits consist of the following: It helps SMEs better understand the needs of their customers, markets, products, or rivals. It also allows SMEs stay current with technological advancements and improve their marketing strategies. Finally, it allows SMEs assess how innovation, product quality, and technology dynamics affect business performance. In addition to Chege et al. (2019)'s list of several advantages, Tarutė and Gatautis (2013) noted that ICT benefits SMEs in four key ways, which include the following: enable more visibility for SMEs; supports financial transactions; would allow SMEs to access more information; and enable SMEs to transcend traditional barriers.

Established in 2002, the Regulatory Authority for Post and Telecommunications of the DR-Congo (ARPTC) is the industry regulator in the DR-Congo. The Congolese Post and Telecommunications Society (SCPT), a national network provider (fixed network), and four mobile network providers – Vodacom DR-Congo, Airtel DR-Congo, Orange DR-Congo, and Africell DR-Congo – make up the majority of the ICT market. With about 35% of the market, Vodacom leads the mobile and Internet services sector; yet, the Internet penetration rate is among the lowest in Africa. In the 2000s, it was expected to be less than 1%; in 2005, it was 0.23%; in 2010, it was 0.72%; in 2015, it hit 3.8%; and as of the second quarter of 2019, it was estimated to be 17% (CIPESA, 2019). Tobias and Neureiter (2020) also noted that, at roughly 26%, DR-Congo has the lowest average mobile connectivity penetration in Sub-Saharan Africa, while the area has a 43% penetration rate.

The evolution of Internet access rates in DR-Congo is depicted in the following diagram (**Figure 3**).



The penetration rate is erratic, as seen, indicating sluggish growth.

Figure 3: **Individuals using the Internet (% of population) in the DR-Congo**

Source: Adapted from World Bank (2024)

To obtain an improved perspective of the Internet penetration rate in both countries, the following diagram (**Figure 4**) illustrates the ranking of Internet users in selected African countries.

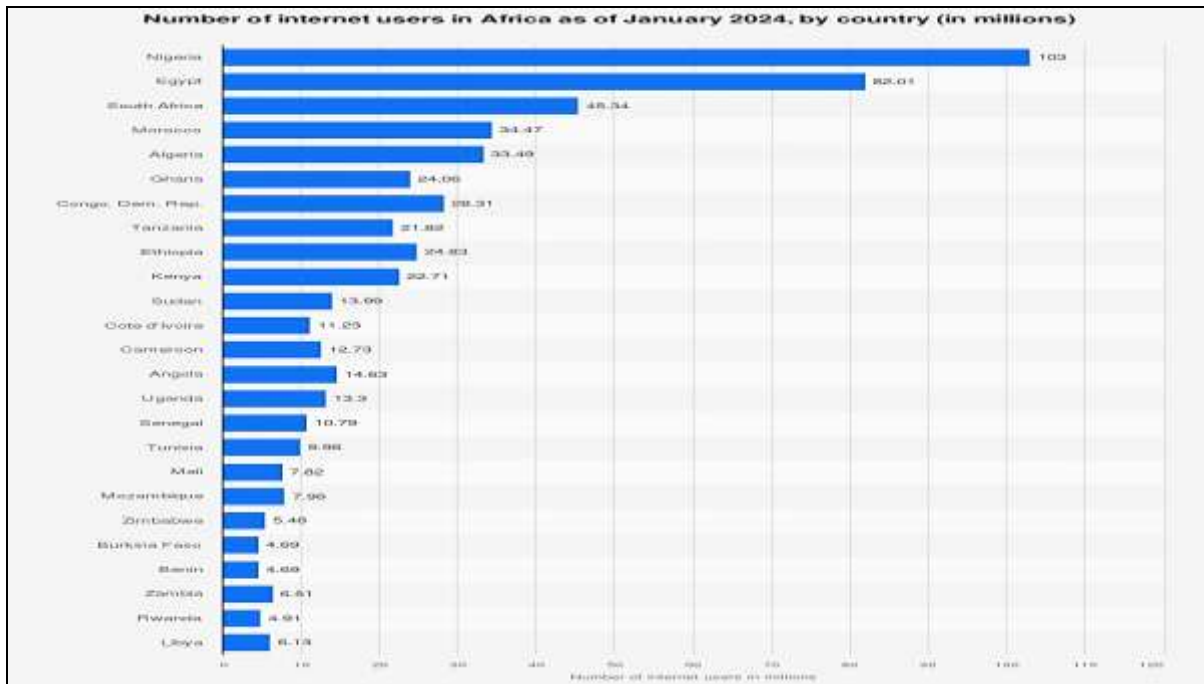


Figure 4: Internet users in Africa

Kalumendo (2022) used a sample of 53 respondents to investigate the obstacles to SMEs' computerisation in the DR-Congo's North Kivu Province. The study's conclusions showed that SMEs face difficulties in adopting ICT. Among the issues noted are the management's attitude toward the adoption of ICT, the need for managers to be better informed about the advantages of ICT, and the lack of funds to purchase ICT equipment. The availability of infrastructure was another obstacle because ICT equipment was said to be quite expensive. In this challenge, the necessity of a steady supply of electricity was also stressed. ICT operators are therefore forced to operate in the unorganised sector due to the overly cumbersome laws in the industry, and external support from the government and other stakeholders needs to be addressed. The study's conclusion suggested a better strategy for ICT adoption to boost DR-Congo SMEs' competitiveness.

Management competency

According to Monang, Sudirman, Siswanto, and Yassierli (2022), management competencies indicate business owners' general ability to perform tasks efficiently, emphasising the connection between managerial and entrepreneurial responsibilities. According to Emmanuel, Rikwentishe, and Attayi (2023), managerial competencies include effectively managing internal and external resources inside the organisation, irrespective of the manager's position in the hierarchy. Effectively managing and coordinating relationships with the government, clients, authorities, suppliers, and any other parties engaged in an organisation's growth and development strategy is a component of external competency. Addressing problems and disputes inside the company requires internal capabilities. However, external talents are necessary to preserve and maintain good stakeholder interactions. A person's ability to complete a specific task is frequently linked to their individual competencies (Emmanuel et al., 2023).

Management competency is essential for SMEs' sustainability and expansion in the DR-Congo's uncertain political and economic landscape. A very unpredictable and competitive business environment is produced by the nation's persistent problems, which include political instability, inadequate infrastructure, little support from the government, and pervasive poverty. To successfully plan, coordinate, and oversee their business activities under such circumstances, SMEs must have good managerial competencies. Stability inside the company depends on the ability to manage internal resources, settle disputes, and make wise decisions. In order to obtain opportunities and get beyond logistical or regulatory obstacles, it is equally crucial to establish and maintain excellent relationships with

external players, such as suppliers, customers, and government authorities. SMEs in the DR-Congo run the danger of subpar performance, constrained expansion, and even company failure in the absence of these vital management skills. Therefore, for SMEs to succeed in such a precarious economy, increasing management competency is not only advantageous but also essential.

Research methodology

The study was quantitative in nature and employed an exploratory research approach. The study's target population comprised SMEs in selected cities (Kinshasa, Lubumbashi & Kolwezi) in DR Congo. The sample consisted of 177 established business in the selected regions. SMEs were sample in the selected economic regions owing to their economic importance of the country.

The study made use of a cluster sampling approach. The study employed a self-administered electronic questionnaire with closed-ended questions, and in order to minimize central tendency bias, it was evaluated using a 6-point Likert scale. The study used existing data collection instruments, divided into two sections: A, which contained demographics and business information; B-D, which asked about variables like government support, financial access, ICT adoption, and management competency. The construct employed to measure government support was borrowed from the GEM expert survey (2021); financial access was evaluated using the GEM expert survey (2021) scale, ICT adoption using the scale developed by Chege et al. (2019) management competency was assessed through Zacca and Dayan (2018) scale. In the DR-Congo, SMEs were mainly contacted through the open-access website of the subcontracting authority of the private sector (ARSP). Full details of their membership are provided.

The data was analysed using SPSS version 28. For the purpose of this study, data were analysed strictly using descriptive and frequencies statistics. The following section provides an overview of the sample.

Table 1: Profile of SMEs

SME profile	Frequency	Percentage
Gender		
Male	155	87.6
Female	22	12.4
TOTAL	177	100
Number of Employees		
Micro (between 1 and 5 employees)	20	11.3
Micro (between 6 and 10 employees)	43	24.3
Small (11-49 employees)	84	47.5
Medium (50-249 employees)	29	16.4
Large (More than 250 employees)	1	0.6
TOTAL	177	100
Number of Years in Operation		
Between 3.5 and 10 years	133	75.1
Longer than 10 years	44	24.9
TOTAL	177	100
SME sector		
Agriculture	11	6.2
Mining	7	4.0
Manufacturing	6	3.4
Construction	31	17.5
Education	1	0.6
Trade (including wholesale)	20	11.3
Transport / Distribution	10	5.6
Health Safety	1	0.6
Tourism	2	1.1
Financial Services	4	2.3
Services (Salon, Hairdresser etc.)	84	47.5
TOTAL	177	100

Table 1 shows that the majority of the sample consisted of male-owned SMEs, 87.6% vs 12.4% for females. The gender profile confirmed previous studies that indicated that male ownership in SMEs is significantly higher than that of females, with most businesses operating for over 3,5 years to 10 years. The largest percentage of the sample was also from the service sector (n=84, 47.0%), then the construction (n=31, 17.5%) and trade (n=20, 11.3%) sectors. Ahinful et al. (2021) posited that the business sector in which an SME operates can influence the ability to enter and exit the market, ultimately impacting the firms' concentration levels and performance.

Table 2:

	Mean	Std Deviation
Government support		
A1	2,68	1,632
A2	2,86	1,573
A3	2,96	1,557
A4	2,86	1,531
A5	2,29	1,349
A6	2,43	1,495
A7	2,37	1,432
Financial Access		
B1	3,06	1,654
B2	2,59	1,399
B3	2,28	1,365
B4	2,95	1,577
B5	2,25	1,339
B6	2,17	1,294
B7	2,24	1,348
B8	2,84	1,501
ICT Adoption		
C1	5,16	1,122
C2	4,85	1,160
C3	5,27	0,821
C4	4,62	1,143
C5	5,13	0,866
C6	5,31	0,737
C7	5,11	0,988
Management competency		
D1	4,88	1,009
D2	5,11	0,787
D3	5,17	0,686
D4	5,19	0,831
D5	5,05	0,900
D6	5,37	0,653

- The low mean average score of $\bar{X} = 2$ on the government support scale indicates that DR-Congo SME owners believe that government support is insufficient and ineffectual. This reflects persistent issues such limited access to infrastructure (science parks, business incubators), training, and services, which is in line with other research showing the nation's lack of institutional support.
- With an average mean score of $\bar{X} = 2.5$ for financial access, DR-Congo SME owners have moderate to limited access to capital. This is a reflection of persistent issues including stringent lending requirements and a lack of specifically designed financial products for SMEs.
- Given a high mean average score of $\bar{X} = 5$ for ICT adoption, SMEs in the DR-Congo are actively utilising digital tools to enhance marketing, communication, and business operations.

- The high mean score of $\bar{X} = 5$ for management competency indicates that DR-Congo SME owners believe they have good managerial abilities. This shows how confident they are in their ability to manage internal operations, stakeholder interactions, and decision-making.

Discussion of findings

In relation to government support, overall mean results for all items measuring this scale were negative. These findings could have several causes, as the preceding sections suggested, the DR-Congo has several initiatives to support their SME sector. However, the study's findings demonstrate a discrepancy between the goals of these initiatives and their real effects. Bureaucracy, complex procedures, paperwork, and the overall approval processes are just a few of the problems that have been identified by the literature research on the difficulties SMEs face when trying to obtain government-related assistance (Nongolola, 2020; Sadiki Mutarushwa et al., 2020; Woldie et al., 2018). The competency and effectiveness of government workers should be added to the previously mentioned issue; SMEs' incapacity to receive sufficient and adequate support from government representatives frequently results in frustration and discouragement, which influences their impression of government services in general. In addition, the nation's poor state of affairs is typified by a dearth of governance, weak institutions, and general corruption, all of which have slowed the development of the formal SME ecosystem (Sadiki Mutarushwa et al., 2020; Woldie et al., 2018). Even if there have been recent revisions to introduce new policies and support institutions to help SMEs, some of the policies pertaining to SMEs are still in effect. It is crucial to remember that the new regulations and programs aimed at helping SMEs have not yet been assessed (Lokonde, 2022). Furthermore, it is important to remember that the majority of SMEs are informal in nature, meaning that they are not supported by officially recognized government organizations but rather by unofficial networks and community support. The primary cause of the reliance on informality is a lack of effective governance and the rule of law, which fosters an atmosphere in which institutions established by the government are deemed unneeded and unimportant.

Concerning Financial access, Although the aforementioned research backs up the idea that SME performance and financial access are positively correlated, the study has shown that this relationship is only occasionally true for the DR-Congo. There are a number of financial institutions in the nation, but their effectiveness is still in doubt. According to Msomi and Maharaj (2022), 90% of African SMEs stated that funding is a major concern for both new and expanding investments. Small businesses' restricted access to financial markets due to perceived risk, informational obstacles, and increased intermediation costs can be the reason of this. According to Doacă (2022), SMEs' ability to obtain financing depends on the caliber of institutional development. The inefficiency of DR-Congo's financial systems could be a reasonable explanation for these findings. Access to finance for SMEs is mostly dependent on strong and efficient financial markets that link lenders and investors looking to participate in companies. More structure is required in the financial systems of emerging and developing nations.

As for ICT adoption, overall, most of the SMEs that were sampled reported making effective use of tools at their disposal. ICTs are used by SMEs in the DR-Congo to access data and other business-related information in order to improve customer service. As mentioned previously, ICT improves customer experience by streamlining operations and processes. SMEs may therefore use technology to automate processes, reduce errors, and make data-driven choices. Increased profitability, cost reduction, and revenue growth can thus result from better systems and processes Chege et al. (2019). Despite the fact that ICT has been reported as beneficial for DR-Congo SMEs, challenges such as the high costs, the limited number of providers, and the general need for knowledge about ICT benefits.

Lastly, in relation to management competency, it was eye-opening to notice that on overall majority of the SMEs sampled have excellent management acumen. SME owners appeared to be competent in managing resources at their disposal effectively and efficiently; optimal use of resources ensures that proper allocation is done, waste is minimised, and management action is focused. An effective and efficient utilisation of resources will ultimately result in increased production and customer satisfaction, which will improve performance (Emmanuel et al., 2023). This particular skill is important given the characteristic of the turbulent business environment in the DR-Congo.

Conclusion, limitations and recommendations

This study sought to answer the primary research question: to what extent do government support, financial access, ICT adoption, and management competency affect SMEs in the DR-Congo? The results of the frequencies analyses reported that ICT adoption and management competencies were among the key priorities for SMEs development. Findings of the study also revealed that government support and financial access although important for SMEs appeared to be least helpful mainly owing to the inability to ensure their efficiencies,

A number of helpful suggestions are made in light of the study's findings, which again examined important SME development issues in the DR-Congo with an emphasis on the importance of financial access, government support, ICT adoption, and management competency. These include the following:

- **Government support:** The government should ensure information is accessible and shared, and consider using social media for advertising programs. Regular monitoring and communication among stakeholders can ensure goals are met. Government employees should receive training in order to provide better support to SMEs.

- **Financial access:** The DR-Congo has launched the "Guarantee Fund for Entrepreneurship" to offer technical and financial support to SMEs. However, its effectiveness is uncertain. More initiatives should be initiated, with international experts and stakeholders collaborating to improve strategies. The credit guarantee scheme should simplify lending, registration, and tax regimes.

- **ICT adoption:** A literature review for DR-Congo highlighted challenges in technology adoption, including limited operators, internet costs, resource requirements, and sector legislation. The government regulates the ICT sector, requiring constant monitoring and evaluation of policies to ensure they align with regional and continental standards. The DR Congo needs to upgrade its ICT infrastructure for efficient service, collaborating with the private sector. The low internet penetration rate in the country suggests exoneration for ICT-related requirements, enabling private operators to import at lower costs and resell to the public.

- **Management competency:** To further improve SMEs' capacity for management, a variety of training methods, including coaching, mentoring, on-the-job training, and role-playing, should be applied either singly or in combination.

A major limitation of the study is that it only uses data gathered from SMEs in the cities of Kinshasa, Lubumbashi, and Kolwezi to draw its conclusions. When compared to other DR-Congo regions, these urban centres offer comparatively greater market access, infrastructure, and business support services. The results might therefore not accurately represent the difficulties or experiences that SMEs in rural or underdeveloped regions of the nation confront. As such, it is important to use caution when interpreting the results, as they cannot be applied to all SMEs in the DR-Congo.

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Appendix A: Descriptive statistics/ DR Congo

Government support			Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree	Total
DR Congo	A wide range of government assistance for new and growing firm can be obtained through contact with a single agency	Count	58	45	15	22	29	8	177
		%	32.8%	25.4%	8.5%	12.4%	16.4%	4.5%	100.0%
	Science parks and business incubators provide effective support for new and existing firms	Count	44	45	25	28	25	10	177
		%	24.9%	25.4%	14.1%	15.8%	14.1%	5.6%	100.0%
	There are adequate number of government agency for new and growing firms	Count	40	44	20	38	26	9	177
		%	22.6%	24.9%	11.3%	21.5%	14.7%	5.1%	100.0%
	There are adequate number of government programs for new and growing businesses	Count	39	53	19	34	23	9	177
		%	22.0%	29.9%	10.7%	19.2%	13.0%	5.1%	100.0%
	The people working for government agencies are competent, effective in supporting new and growing business	Count	63	53	29	16	11	5	177
		%	35.6%	29.9%	16.4%	9.0%	6.2%	2.8%	100.0%
	Almost anyone who needs help from a government program for a new and growing business can find what they need	Count	62	52	20	17	20	6	177
		%	35.0%	29.4%	11.3%	9.6%	11.3%	3.4%	100.0%
	Government programs aimed at supporting new and growing business are effective	Count	58	62	20	15	15	7	177
		%	32.8%	35.0%	11.3%	8.5%	8.5%	4.0%	100.0%

Appendix B: Descriptive statistics/ DR Congo (cont'd)

Financial access			Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree	Total
DR Congo	Equity funding is available for new and growing firms	Count	41	43	17	28	37	11	177
		%	23.2%	24.3%	9.6%	15.8%	20.9%	6.2%	100.0%
	Debt funding is available for new and growing firms	Count	47	56	20	32	20	2	177
		%	26.6%	31.6%	11.3%	18.1%	11.3%	1.1%	100.0%
	Government subsidies available for new and growing firms	Count	66	52	21	23	11	4	177
		%	37.3%	29.4%	11.9%	13.0%	6.2%	2.3%	100.0%
	Funding available from informal investors (family, friends and colleagues) who are private individuals (other than founders) for new and growing firms	Count	43	42	17	37	31	7	177
		%	24.3%	23.7%	9.6%	20.9%	17.5%	4.0%	100.0%

	Professional business angels funding is available for new and growing firms	Count	66	54	21	21	12	3	177
		%	37.3%	30.5%	11.9%	11.9%	6.8%	1.7%	100.0%
	Venture capitalist funding available for new and growing firms	Count	68	60	16	19	12	2	177
		%	38.4%	33.9%	9.0%	10.7%	6.8%	1.1%	100.0%
	Funding available through initial public offerings (IPOs) for new and growing firms	Count	66	55	23	14	15	3	176
		%	37.5%	31.3%	13.1%	8.0%	8.5%	1.7%	100.0%
	Private lenders funding available (Crowdfunding) available for new and growing firms	Count	44	43	23	33	30	3	176
		%	25.0%	24.4%	13.1%	18.8%	17.0%	1.7%	100.0%

Appendix C: Descriptive statistics/ DR Congo (cont'd)

	Technology adoption		Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree	Total
DR Congo	Internet connectivity is available to business if needed	Count	5	4	4	13	70	81	177
		%	2.8%	2.3%	2.3%	7.3%	39.5%	45.8%	100.0%
	Technology applications are user-friendly	Count	5	7	5	27	82	51	177
		%	2.8%	4.0%	2.8%	15.3%	46.3%	28.8%	100.0%
	New technology improves the existing business process	Count	1	2	2	14	83	75	177
		%	0.6%	1.1%	1.1%	7.9%	46.9%	42.4%	100.0%
	Some applications were replaced by a new system in the firm	Count	1	15	8	38	80	35	177
		%	0.6%	8.5%	4.5%	21.5%	45.2%	19.8%	100.0%
	Technology is used to promotes business efficiency	Count		4	4	20	86	63	177
		%		2.3%	2.3%	11.3%	48.6%	35.6%	100.0%
	Use of technology enhance quick service to customers	Count			6	11	83	77	177
		%			3.4%	6.2%	46.9%	43.5%	100.0%
	Use of technology enables the firm to get market information	Count	2	3	8	15	81	68	177
		%	1.1%	1.7%	4.5%	8.5%	45.8%	38.4%	100.0%

Appendix D: Descriptive statistics (cont'd)

Management			Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree	Total
Democratic Republic of Congo	Managers make resource allocation decisions that achieve maximum results	Count	2	9		28	97	41	177
		%	1.1%	5.1%		15.8%	54.8%	23.2%	100.0%
	One of our greatest strengths is achieving results by organising and motivating people	Count		1	4	28	86	58	177
		%		0.6%	2.3%	15.8%	48.6%	32.8%	100.0%
	One of our greatest strengths is organising resources and coordinating tasks	Count		1	1	20	100	55	177
		%		0.6%	0.6%	11.3%	56.5%	31.1%	100.0%
	One of our greatest strengths is our ability to supervise, influence and lead people	Count		4	2	17	87	67	177
		%		2.3%	1.1%	9.6%	49.2%	37.9%	100.0%
	One of our greatest strengths is our ability to delegate effectively	Count	1	2	7	24	86	57	177
		%	0.6%	1.1%	4.0%	13.6%	48.6%	32.2%	100.0%
	One of our greatest strengths is our ability to keep this organisation running smoothly	Count			2	11	84	80	177
		%			1.1%	6.2%	47.5%	45.2%	100.0%

Effect of green human resource practices on organizational sustainability: The mediating role of environmental and employee performance

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Keywords

Green HRM, Organizational Sustainability, Environmental Performance, Employee Performance, SEM

Abstract

This study investigates the influence of Green Human Resource Management (GHRM) practices on organizational sustainability, emphasizing the mediating roles of environmental and employee performance. Drawing on the Resource-Based View and stakeholder theory, the research uses a quantitative approach with data collected from 250 employees across various industries adopting green HR initiatives. Structural Equation Modeling (SEM) was employed to analyze the data. Findings reveal that GHRM significantly impacts organizational sustainability, both directly and indirectly through improved environmental and employee performance. This study contributes to the literature on sustainable HR strategies and offers practical insights for organizations seeking long-term ecological and operational sustainability.

Introduction

In recent years, the global push for sustainability has significantly reshaped the strategic agendas of organizations across sectors. Driven by increasing environmental concerns, stricter regulations, and growing stakeholder expectations, businesses are now under greater pressure to adopt practices that ensure ecological balance, social equity, and long-term economic viability. In this context, Human Resource Management (HRM) plays a critical role not only in shaping organizational culture and values but also in aligning the workforce with sustainability goals.

Green Human Resource Management (GHRM) has emerged as a pivotal strategic tool that integrates environmental management into HRM policies and practices. By embedding environmental awareness and sustainable practices into key HR functions—such as recruitment, training, performance appraisal, and compensation—GHRM aims to promote pro-environmental behavior among employees while enhancing organizational commitment to sustainable development. As such, GHRM transcends traditional HRM by linking human capital management with ecological responsibility, positioning itself as a catalyst for organizational change.

Despite the theoretical appeal and increasing adoption of GHRM practices, empirical studies examining their effectiveness in achieving sustainability outcomes remain limited. Most existing research has focused either on the implementation of green practices or on their impact on individual-level outcomes like job satisfaction and engagement. However, there is a critical need to understand how GHRM practices contribute to broader organizational outcomes, particularly organizational sustainability—which includes environmental, social, and economic performance.

This study addresses this gap by exploring the mediating mechanisms through which GHRM influences sustainability outcomes. Specifically, it investigates the roles of environmental performance and employee performance as mediators in the relationship between GHRM and organizational sustainability. Environmental performance reflects the organization's capability to manage its environmental impact effectively, while employee performance includes both traditional job performance and green behavior. Understanding these mediating variables is crucial for designing HR strategies that are both environmentally effective and operationally efficient.

To guide this investigation, the study draws upon the Resource-Based View (RBV) of the firm, which views human resources and organizational capabilities as key drivers of competitive advantage.

Additionally, Stakeholder Theory informs the ethical and social dimensions of sustainability, emphasizing the organization's responsibilities toward both internal stakeholders (employees) and external ones (the environment and community).

Research Objectives

The specific objectives of this study are:

- To examine the direct impact of Green Human Resource Management practices on organizational sustainability.
- To analyze the influence of GHRM on environmental performance and employee performance.
- To investigate the mediating roles of environmental and employee performance in the relationship between GHRM and organizational sustainability.

Significance of the Study

This study contributes to both academic and managerial perspectives. Theoretically, it enriches the GHRM and sustainability literature by empirically testing a mediation model. Practically, it offers actionable insights for HR practitioners and organizational leaders aiming to design HR policies that not only improve environmental outcomes but also enhance employee performance and long-term organizational sustainability.

Literature Review

Green Human Resource Management (GHRM)

Green Human Resource Management (GHRM) involves integrating environmental objectives into HR functions to support sustainability within organizations (Renwick et al., 2013). Core practices include green recruitment (attracting candidates with environmental values), green training (educating employees on eco-friendly practices), and green performance management (linking employee appraisals to environmental goals) (Jabbour, 2011).

GHRM fosters not only improved environmental performance but also enhances innovation and operational efficiency (Jabbour & Santos, 2008). Tang et al. (2018) highlight that green rewards and compensation systems further reinforce sustainable behavior by aligning incentives with environmental objectives.

Organizational Sustainability

Organizational sustainability refers to a business's ability to operate in an environmentally, socially, and economically responsible manner for long-term success (Elkington, 1997). The Triple Bottom Line framework underscores the importance of balancing ecological stewardship, social equity, and economic growth.

Embedding sustainability into business strategy enhances brand reputation, stakeholder trust, and resilience (Daily & Huang, 2001). GHRM plays a pivotal role by aligning people management strategies with sustainability values, thereby embedding eco-consciousness into the organizational culture (Pham et al., 2019).

Environmental Performance

Environmental performance reflects an organization's ability to minimize ecological impact through energy efficiency, pollution reduction, and regulatory compliance (Daily et al., 2012). GHRM contributes to this by nurturing a culture of environmental accountability among employees (Jackson et al., 2011).

Green training programs enhance employees' skills in adopting sustainable work practices (Jabbour et al., 2010), while green leadership and inclusive decision-making promote shared environmental values across organizational levels (Chen et al., 2015).

Employee Performance

Employee performance, in the GHRM context, includes not only productivity but also pro-environmental behaviors such as energy conservation and recycling (Ones & Dilchert, 2012). GHRM fosters this dual performance through increased engagement, job satisfaction, and organizational citizenship behavior (Dumont et al., 2017; Paillé et al., 2014).

Such practices also align with employees' intrinsic motivations, enhancing the psychological contract and commitment to organizational goals. This alignment supports both ecological responsibility and overall productivity.

Mediating Role of Environmental and Employee Performance

Growing evidence suggests that environmental and employee performance mediate the link between GHRM and organizational outcomes. Shah (2019) demonstrated that green training enhances sustainability through improved environmental practices. Similarly, employee involvement in sustainability projects has been shown to mediate the effects of GHRM on organizational innovation and competitiveness (Yusliza et al., 2020).

These mediating effects are supported by the Resource-Based View (RBV), which frames human and environmental capabilities as valuable and rare resources that contribute to sustained competitive advantage (Barney, 1991). Stakeholder Theory (Freeman, 1984) also emphasizes the importance of considering both internal (employees) and external (environmental) stakeholders in designing sustainable HR strategies.

Key Takeaways from the Literature

- GHRM serves as a strategic enabler of sustainability through its influence on both employee behavior and environmental processes.
- Environmental and employee performance are not only outcomes of GHRM but also key channels through which it impacts long-term organizational sustainability.
- Despite growing evidence, few empirical studies have explored this dual mediation mechanism, particularly in developing economies and varied industry contexts.

Hypothesis Development

- H1: Green HRM practices positively affect organizational sustainability.
- H2: Green HRM practices positively affect environmental performance.
- H3: Green HRM practices positively affect employee performance.
- H4: Environmental performance positively affects organizational sustainability.
- H5: Employee performance positively affects organizational sustainability.
- H6: Environmental performance mediates the relationship between GHRM and organizational sustainability.
- H7: Employee performance mediates the relationship between GHRM and organizational sustainability.

Methodology

Research Design This study adopts a quantitative, cross-sectional research design to ensure objectivity and generalizability.

Sampling and Data Collection Data were collected using a structured questionnaire distributed to 250 employees in manufacturing and service sectors known to implement green HR practices. A stratified random sampling technique ensured diverse representation.

Measurement Instruments All constructs were measured using previously validated scales on a 5-point Likert scale. GHRM practices were adapted from Renwick et al. (2013), environmental performance from Daily & Huang (2001), employee performance from Paillé et al. (2014), and sustainability from Elkington (1997).

Data Analysis Statistical analyses were conducted using SmartPLS. Reliability and validity were tested using Cronbach's Alpha, Composite Reliability, and AVE. Structural Equation Modeling (SEM) was used to examine direct and mediating effects.

Results and Analysis

5.1 Descriptive Statistics Participants included 58% male and 42% female employees from various departments. Most respondents had more than five years of work experience.

5.2 Reliability and Validity All constructs demonstrated good reliability (Cronbach's alpha > 0.7)

Construct	Cronbach's Alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)
Green HRM	0.88	0.91	0.67
Environmental Performance	0.85	0.88	0.63
Employee Performance	0.87	0.90	0.65
Organizational Sustainability	0.89	0.92	0.70

and validity (AVE > 0.5). HTMT ratios confirmed discriminant validity.

Table 1.

The results as per table 1 indicate that all constructs demonstrate acceptable levels of reliability and validity:

- **Cronbach's Alpha** values exceed the recommended 0.70 threshold, confirming internal consistency of the constructs.
- **Composite Reliability (CR)** values are above 0.80, indicating high convergent reliability.
- **Average Variance Extracted (AVE)** values exceed 0.50, demonstrating that each construct captures sufficient variance from its indicators relative to error.

These metrics confirm that the measurement model is both statistically sound and appropriate for use in Structural Equation Modeling (SEM).

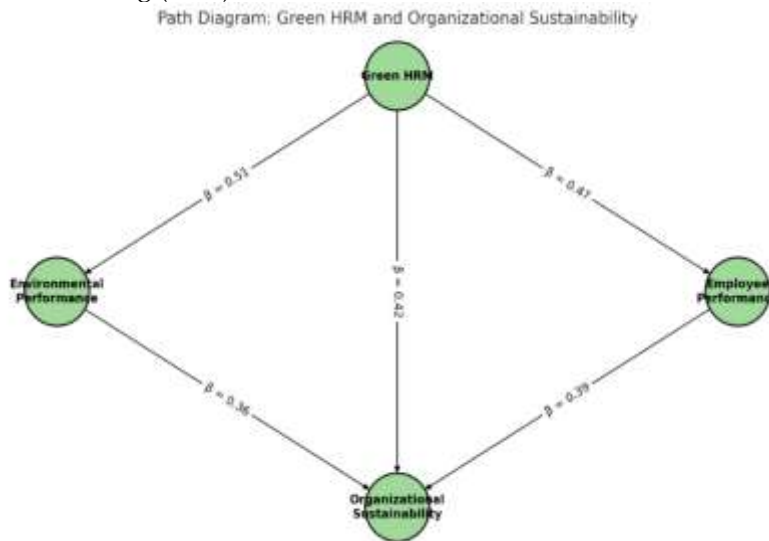


Fig.1

Structural Model and Hypothesis Testing Path analysis results:

- H1: Supported ($\beta = 0.42$, $p < 0.001$)
- H2: Supported ($\beta = 0.51$, $p < 0.001$)
- H3: Supported ($\beta = 0.47$, $p < 0.001$)
- H4: Supported ($\beta = 0.36$, $p < 0.01$)
- H5: Supported ($\beta = 0.39$, $p < 0.01$)
- H6: Supported (indirect effect $\beta = 0.18$, $p < 0.01$)
- H7: Supported (indirect effect $\beta = 0.16$, $p < 0.01$)

Summary table of hypothesis testing results:

Hypothesis	Path	β Value	p-value	Result
H1	Green HRM $\rightarrow$ Organizational Sustainability	0.42	< 0.001	Supported

H2	Green HRM → Environmental Performance	0.51	< 0.001	Supported
H3	Green HRM → Employee Performance	0.47	< 0.001	Supported
H4	Environmental Performance → Organizational Sustainability	0.36	< 0.01	Supported
H5	Employee Performance → Organizational Sustainability	0.39	< 0.01	Supported
H6	GHRM → Environmental Performance → Organisational Sustainability	0.18	< 0.01	Supported
H7	GHRM → Employee Performance → Organisational Sustainability	0.16	< 0.01	Supported

Table.2

Table: R-square (R^2) Values for Endogenous Constructs

Construct	R-square (R^2)
Environmental Performance	0.62
Employee Performance	0.59
Organizational Sustainability	0.67

Table.3

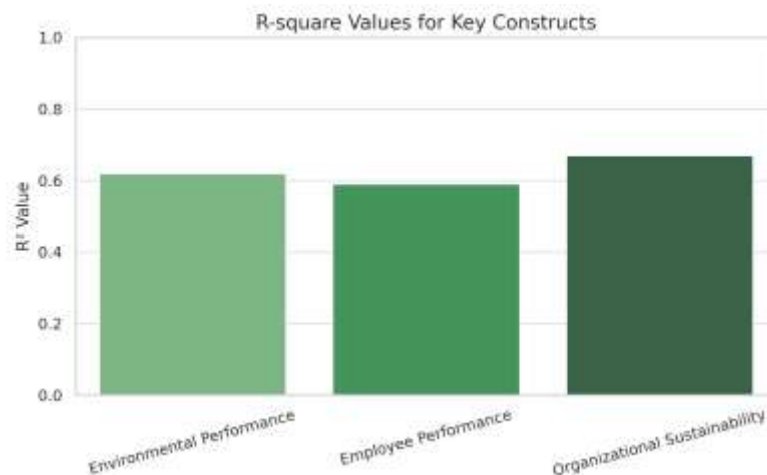


Fig.2

R-square (R^2) values represent the proportion of variance in the dependent (endogenous) variables that can be explained by the independent (exogenous) variables in the model. In this study:

- **Environmental Performance ($R^2 = 0.62$):** 62% of the variance in environmental performance is explained by Green HRM practices. This indicates a substantial influence, highlighting the effectiveness of green HR interventions.
- **Employee Performance ($R^2 = 0.59$):** 59% of the variation in employee performance can be attributed to GHRM, which is a strong explanatory power, suggesting that green practices significantly shape employee behaviors and outcomes.
- **Organizational Sustainability ($R^2 = 0.67$):** The model explains 67% of the variance in organizational sustainability, which demonstrates a strong model fit and reinforces the critical role of both environmental and employee performance as mediators between GHRM and sustainability outcomes.

According to Chin (1998), R^2 values of 0.67, 0.33, and 0.19 are considered substantial, moderate, and weak respectively in SEM analysis. Hence, all three constructs exhibit **substantial explanatory power**, supporting the robustness of the structural model.

Discussion

The findings of this study provide empirical support for the proposition that Green Human Resource Management (GHRM) practices positively impact organizational sustainability. Importantly, the results

also affirm the mediating roles of environmental performance and employee performance, thereby providing a more nuanced understanding of how green HR strategies contribute to broader sustainability goals.

The direct relationship between GHRM and organizational sustainability (H1) aligns with the Resource-Based View (RBV), which asserts that firms can achieve sustainable competitive advantage through unique, inimitable resources—such as an environmentally conscious workforce and a green organizational culture (Barney, 1991). This supports prior literature indicating that GHRM is not only an HR initiative but a strategic imperative for forward-looking firms (Renwick et al., 2013; Jabbour & Santos, 2008).

The positive impact of GHRM on environmental performance (H2) reaffirms that green HR practices—such as environmental training, green performance metrics, and eco-sensitive reward systems—can strengthen employees' awareness and actions toward environmental responsibility (Daily et al., 2012). Similarly, GHRM's significant impact on employee performance (H3) supports the idea that when employees perceive their organization as environmentally responsible, they are more likely to reciprocate through increased motivation, discretionary effort, and innovative behavior (Paillé et al., 2014; Dumont et al., 2017).

Furthermore, the mediating effects found in H6 and H7 indicate that environmental and employee performance serve as critical channels through which GHRM affects organizational sustainability. This extends the current understanding by showing that GHRM's impact is not only direct but also significantly indirect. These findings highlight the synergistic relationship among HR practices, individual behavior, and environmental outcomes, and illustrate how these elements together drive sustainability.

From a theoretical perspective, the findings reinforce both the RBV and Stakeholder Theory. By investing in green competencies and engaging both internal (employees) and external (environmental) stakeholders, firms can enhance their sustainability performance. This study thereby bridges the conceptual and empirical gap by validating the multi-layered influence of GHRM on sustainability outcomes.

Conclusion and Recommendations

This study highlights the strategic role of GHRM in promoting organizational sustainability. By enhancing environmental and employee performance, green HR practices can drive substantial ecological and operational improvements. Organizations are encouraged to integrate GHRM policies at all HR levels and align them with broader sustainability goals.

Recommendations

Based on the results, several practical recommendations are proposed for organizations aiming to enhance their sustainability performance through HR strategies:

Institutionalize Green HR Practices: Incorporate green policies in recruitment, training, performance appraisal, and compensation frameworks to ensure environmental objectives are integrated throughout the employee lifecycle.

Promote Environmental Training and Awareness: Conduct regular workshops and training sessions that build employee knowledge and skills in environmental management practices such as energy efficiency, waste reduction, and green compliance.

Link Sustainability to Performance Appraisal: Develop performance metrics that include green targets. This encourages accountability and rewards eco-conscious behavior among employees.

Foster a Green Organizational Culture: Leaders should visibly support sustainability efforts and cultivate a shared vision for environmental responsibility within the workforce.

Measure and Monitor Environmental and Employee Outcomes: Organizations should establish clear KPIs for tracking environmental performance and employee contributions to green initiatives. These metrics can inform strategic decision-making.

Encourage Bottom-Up Innovation: Provide platforms for employees to suggest green initiatives or participate in sustainability projects, which can increase ownership and enhance morale.

Limitations and Future Research

While this study provides valuable insights into the relationship between Green Human Resource Management (GHRM) practices and organizational sustainability, several opportunities exist for future research to build upon these findings:

Longitudinal Studies

This study employed a cross-sectional design, capturing responses at a single point in time. Future research could adopt longitudinal methodologies to assess how the impact of GHRM on environmental and employee performance evolves over time. Such approaches would help validate causality and track sustainability progress.

Cross-Cultural Comparisons

The current research is limited to a specific geographical and cultural context. Future studies could compare GHRM practices and their outcomes across different countries or regions, considering variations in cultural values, environmental regulations, and organizational norms.

Self-Reported Data

The use of self-reported surveys may introduce bias due to social desirability or respondent overestimation of performance. Incorporating multi-source data—such as supervisor ratings, archival environmental audit scores, or customer perceptions—could strengthen measurement validity.

Sectoral Differences and Generalizability

This study sampled organizations across general industries without deep differentiation by sector. However, the **implementation and impact of GHRM practices can vary considerably across sectors**. For instance:

- In **manufacturing or heavy industries**, regulatory pressures and environmental risks may necessitate more stringent green practices.
- In **IT or service sectors**, green initiatives may focus more on paperless processes, energy-efficient buildings, and remote work.

Future research could conduct **sector-specific analyses** to better understand how GHRM is operationalized differently in, say, logistics, education, healthcare, or public sector organizations. These insights would help contextualize GHRM strategies rather than applying a one-size-fits-all model.

Practical Implementation Barriers

While GHRM is conceptually appealing, organizations often face **practical challenges** in embedding such practices into their core HR functions. Barriers include:

- **Budget constraints** for green training or eco-friendly infrastructure.
- **Lack of managerial commitment or awareness** about sustainability.
- **Resistance to change** from employees unfamiliar with green standards.
- **Inadequate metrics** to evaluate green performance objectively.

These real-world constraints are underexplored in academic research. Future studies could use case study methods or interviews with HR managers to delve deeper into the **practical limitations and enablers** of GHRM deployment.

Exploring Moderating Variables

Additional variables such as organizational size, leadership style, green organizational culture, or environmental awareness could moderate the relationship between GHRM and sustainability. Incorporating such moderators may reveal deeper insights into contextual influences on green outcomes.

Inclusion of External Performance Metrics

While this study focused on internal variables like environmental and employee performance, future research could expand the scope to include external indicators such as customer satisfaction, environmental audit scores, or market reputation as outcomes of GHRM.

Use of Mixed Methods

Integrating qualitative data—such as interviews or case studies—with quantitative methods could offer richer and more nuanced insights into how green HRM is implemented and perceived within organizations.

Role of Technology in GHRM

The use of digital tools and platforms for environmental tracking, green training, and performance appraisal is an emerging trend. Future studies can explore the intersection of GHRM and digital HR technologies in promoting sustainability.

Behavioral Outcomes Beyond Performance

Future researchers could also investigate other individual-level outcomes of GHRM, such as psychological ownership, green citizenship behavior, eco-innovation involvement, and employee well-being, which are increasingly important in sustainable organizations.

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The effectiveness of tax incentives for small and medium sized entities in South Africa: An analysis of section 12E and Interpretation Note 9

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Key Words

small and medium sized entities (SMEs); South Africa; income tax; section 12E; tax incentive; compliance rebate

Abstract

Small and medium sized entities (SMEs) supposedly provide job creation, economic growth and poverty reduction, and tax incentives aimed at this sector should lead to inclusive economic growth. Section 12E of the South African Income Tax Act No. 58 of 1962 (the Act) offers accelerated depreciation allowances to SMEs. However, this allowance is not meeting its intended purpose. Through a doctrinal research approach, this study interrogated the aim of section 12E, its limited coverage, the definition of small and medium businesses in the Act, and the effectiveness of policies targeting SMEs. The allowance is not adequately targeting the correct small businesses and informal enterprises. Additionally, taxation compliance is a challenge for these businesses, and thus taxation allowances that are intended to support SMEs may be misused or incorrectly applied. This study also found that a refundable compliance rebate may be more equitable and offers a solution to existing compliance issues faced by SMEs.

Introduction

Small and medium sized entities (SMEs) are an increasing feature of the global economy, and various developing nations have identified them as a cornerstone to growth in their macroeconomic policies (Johri et al., 2024). The South African government subscribes to this view as evidenced by the National Development Plan: Vision for 2030 (NDP) (NPC, 2011).

In terms of the South African socio-economy, unemployment, poverty and inequality are issues of national concern (Burns, Tomita & Lund, 2017). South Africa's unemployment rate of 30.8% is persistently high (Burns, Tomita & Lund, 2017; Statistics South Africa, 2020b). The NDP, which informs the national budget, is government's long-term strategy to eradicate the socio-economic challenges where the vision is of "an economy that is more inclusive, more dynamic and in which the fruits of growth are shared more equitably" (NPC, 2011:10). The proposed actions to meet this objective are a simplified regulatory environment for SMEs and increased small business support (NPC, 2011). The rhetoric of the NDP is echoed in the African National Congress's (ANC's) National Policy Conference Discussion Document. The ANC underscored the importance of small, black-owned businesses in achieving economic transformation and redressing the historical systematic injustices of apartheid. The document reiterates that "black entrepreneurs would be more successful if they had some form of targeted financial support, including tax breaks, and improved market access" (ANC, 2017:4).

Using correct incentives, entrepreneurship can drive the South African economy from low growth and encourage the unemployed into business ownership and development (Parsons, 2018). This cycle is self-fulfilling as economic growth positively impacts entrepreneurship, which improves income growth, thereby enriching all in South Africa (Moloi et al., 2022).

With the dismantlement of apartheid in 1994, policy-makers introduced programmes to support SMEs in an effort to correct poverty and inequality (Rogerson, 1999). More recently, SMEs have garnered political attention as they employ the vast majority of the South African population and account for more than 50% of South Africa's Gross Domestic Product (GDP) (Petersen, Bruwer & Mason, 2020). Thus SMEs

are linked to poverty alleviation as they typically employ the poorest members of society (Bhorat et al., 2018; Maksimov, Wang & Luo, 2017). Most SMEs fail in their first year of business and a simplified and supportive regulatory environment is purported to decrease such failures (Kauffmann, 2005).

Governments determine resource allocation among citizens and businesses (Maksimov, Wang & Luo, 2017) through fiscal policy, which comprises taxation and government spending (Mountford & Uhlig, 2009). Income tax has been found to be a perceived barrier to both start a business and business growth in South Africa (Khoase *et al.*, 2020). Thus, analysing taxation legislation provides valuable macroeconomic insight. As small businesses are touted as a solution for driving economic growth and promoting an inclusive economy, it is important to assess whether policies, including tax incentives, aimed at helping small businesses are fulfilling their intended purpose (Maksimov, Wang & Luo, 2017).

Section 12E of the South African Income Tax Act No. 58 of 1962 (hereafter s 12E) provides a small business corporation (SBC), as defined, an increased tax incentive in the form of an accelerated depreciation allowance. This study thus aims to identify whether s 12E creates the intended tax relief for small businesses, so fostering economic growth and employment. Section 12E is important, as the Davis Tax Committee (DTC) has questioned the section's effectiveness (DTC, 2014). Assessing the DTC's findings and insights is valuable, and will enhance understanding of how current tax policies are supporting the objectives of inclusive growth and employment.

The seventh issue of Interpretation Note 9 (hereafter IN 9) was released on 25 June 2018. The South African Revenue Service (SARS) releases such notes to provide guidance on the application of sections within the Act (SARS, 2018). Thus, assessment of IN 9 provides insight into how legislative provisions are enacted and applied to taxpayers.

Methodology

This qualitative study used a doctrinal research approach and document analysis to evaluate and interpret results. Document analysis is the evaluation of all forms of documents (Bowen, 2009). Textual analysis was used, which emphasises the meaning one can extract from documents (De Vos, Strydom, Fouche & Delpoit, 2011).

To answer the research question of whether s 12E has developed the intended tax relief for small businesses (i) the purpose of the allowance was established with reference to the NDP, (ii) the definition of a SBC was investigated, (iii) tax statistics were used to analyse the impact of tax policy on SMEs (Carpenter, 2016; DTC, 2014; Gale & Brown, 2013; Knittel *et al.*, 2011), and lastly (iv) prior literature was reviewed with respect to the SME sector's role in employment creation and economic growth, poverty reduction and transformation.

Discussion and findings

Overview of section 12E and Interpretation Note 9

The Act offers accelerated allowances on assets owned by SBCs. For plant and machinery used directly in manufacture, an immediate write-off from taxable income is granted if the asset is brought into use by a SBC for the first time. For businesses that are not SBCs, such assets would normally qualify for a deduction under a different section of the Act over a write-off period of four or five years.

Section 12E(1A) offers an incentive for assets not used directly in manufacturing, but for trade as stated in section 11(e). Section 12E(1A) offers an election between the prescribed section 11(e) write-off (in Interpretation Note 47) or a write-off of 50% on the cost of the asset in the first year of use and 30% and 20% write-offs in the two subsequent years. The Act prescribes the 'cost' of the asset on which allowances are granted as the lesser of the actual cost incurred by the taxpayer and the arm's length cash cost (market value) of the asset at the transaction date. Thereafter, s 12E contains the SBC definition that outlines qualifying criteria for classification as a SBC, and entities that meet the criteria in the SBC definition are granted the accelerated allowance.

SARS released IN 9 to offer guidance over the provisions of s 12E. However, as per the South African Revenue Service Act No. 34 of 1997, SARS's mandate is limited to collections of tax revenue and ensuring compliance with tax legislation, and thus Interpretation Notes are not legally binding, and are an explanatory guide to support statutory provisions.

Intended purpose of section 12E and Interpretation Note 9

The first issue of IN 9 on 13 December 2002 cited the role of SMEs in economic development and employment creation as the rationale behind special taxation dispensations for SMEs. In the South African context and with regard to government's vision to increase black participation in the economy, the purpose includes helping the growth of black businesses (ANC, 2017; NPC, 2011; Rogerson, 1999).

As s 12E offers accelerated allowances on capital assets, it encourages the procurement and development of fixed assets in the SME sector (Kitchen & Knittel, 2016). For prospective investments that are evaluated using net present value or discounted cash flow measures, speedier allowances (as offered in s 12E) increase profitability due to reductions in taxable income at the outset of a project (Bond & Xing, 2015; Gale & Brown, 2013) which therefore stimulate the accumulation of fixed assets and growth within SMEs. The first issue of IN 9 (2002) also stated that s 12E was introduced to regulate the tax relief granted to SMEs through the definition of a SBC, which detailed the criteria for an entity to qualify for SBC allowances. The definition attempted to limit the recipients of accelerated allowances to businesses that will potentially promote growth and employment.

SMEs in South Africa encompass informal micro-enterprises and formal medium sized entities that employ numerous individuals (Achieng & Malatji, 2022; Bureau for Economic Research, 2016; DTC, 2014). The NDP categorises small businesses into three categories (NPC, 2011): (i) *survivalist businesses*, which are informal and do not usually use capital assets; (ii) *lifestyle businesses*, which operate in middle-upper income areas and include professional persons such as doctors; and (iii) *entrepreneurial businesses* that innovate, employ individuals and offer opportunities for economic growth and expansion.

The NDP views entrepreneurial business as the primary source of employment creation (NPC, 2011), and thus they are the intended recipients of tax incentives for SBC (DTC, 2014). Hence, s 12E aims to stimulate entrepreneurial business activity and investment to achieve radical transformation of the South African economy.

This study pertains *solely* to the provisions in s 12E, which contains the SBC definition and accelerated allowances available to SBC.

Analysis of the Small Business Corporation definition

The effectiveness of s 12E depends on whether the incentive targets intended recipients (specifically entrepreneurial businesses). Each aspect of the SBC definition is now analysed with reference to relevant commentary and literature:

The legal entity requirement

To qualify as a SBC, the potential recipient must be a close corporation, co-operative, private company or personal liability company, as contemplated in the relevant sections of the Companies Act No. 71 of 2008.

The holder of shares requirement

To qualify as a SBC, all shareholders of the company must be natural persons and may not hold an interest in any other company, with various special exemptions. IN 9 (2018) explains that such provisions prohibit an individual from splitting income between various SBC in an effort to abuse the incentive.

The natural person requirement dictates that SMEs funded by companies such as venture capitalists may not qualify as SBC. This dissuades institutional investment that could help SBC growth (DTC, 2014). To evaluate the DTC's argument, the role of the venture capital industry in SME development is analysed.

Limited access to funding is a pervasive obstacle faced by SMEs (Ayyagari, Demirguc-Kunt & Maksimovic, 2014; Bureau for Economic Research, 2016; de Kok, Deijl & Velhuid-Van Essen, 2013). Therefore, legislative measures can add value by encouraging institutional investment. Fatoki and Odeyemi (2010) questioned the prevalence of venture capital in SME funding by stating that only 3.8% of venture capital funds have a SME focus. Despite this, Mbhele (2012) argued that venture capital does support entrepreneurial activity and SME growth in South Africa.

Recent revisions of the Broad-Based Black Economic Empowerment Codes and the introduction of the SA SME fund aim to stimulate investment in black-owned businesses. Thus, these initiatives have created demand for specialised venture capital funds that finance small, black-owned businesses (South African Venture Capital and Private Equity Association, 2017). Small, black-owned businesses financed by venture capital are the entrepreneurial businesses envisaged by the NDP. Their ability to obtain funding speaks to their promise and ability to grow, their access to venture capital funding correlates with higher success (Mbhele, 2012), and they are black-owned, increasing diversity in business ownership. Thus the encouragement of venture capital investment would grow the SME sector and transform the economy. The legislature recognises the importance of venture capital, and thus introduced section 12J in the Act that provides incentives to venture capitalists to grow equity investment in SMEs.

However, the natural shareholding limit in the SBC definition unwittingly conflicts with the legislature's intention to encourage investment in SMEs. Therefore, SBCs that receive institutional support should benefit from accelerated allowances in s 12E.

To prevent abuse of the incentive and to allow equity investment into SMEs, the DTC's SME report proposes that corporate shareholdings of SBC should be limited to 33.3% (DTC, 2014). This relaxation may increase the coverage of the allowance to businesses with institutional funding, while preventing abuse. Furthermore, the limitations and exemptions on shareholdings in other companies in the SBC definition are complex and verbose (DTC, 2014). The DTC's SME report suggests that the provision be simplified to exclude companies where any shareholder holds an interest in any other SBC.

Gross income requirement

To restrict the size of qualifying companies, the SBC definition limits gross income of an entity to R20 million. The DTC's SME report however believes that the limit is too restrictive and should be increased to R50 million (DTC, 2014).

To evaluate the reasonability of this limit, the DTI classification of enterprise size is used. The DTI classifies entities into small, medium and large enterprises on the basis of annual turnover. Although turnover (as described in the SBC definition) and gross income (as used by the DTI's categories) are different metrics, these numbers are largely similar for entities. This is because turnover constitutes receipts in cash or credit by the taxpayer for their financial year. Therefore, it forms part of gross income as defined in section 1 of the Act.

The DTI classifies small enterprises to have a turnover range from R13.5 million to R81 million and medium enterprises from R81 million to R432 million (Statistics South Africa, 2020a). Therefore the suggestion to increase the gross income limitation seems reasonable. Furthermore, the United States of America (US) tailors SME size requirements across economic sectors, which is useful as sector-specific factors impact size in each industry (Gale & Brown, 2013). Therefore, if adopted in South Africa, different limits for each sector may capture size per sector with more precision, and this would achieve consistency with the DTI's classification.

Ultimately, any increase in the gross income limitation would increase the coverage of the incentive – possibly promoting growth and profitability in more businesses. Furthermore, tailoring the gross income requirements caters to differing cost structures and business models across sectors.

Business activity requirement

A company cannot qualify as a SBC if more than 20% of its gross income is derived from investment income or income from personal services. Furthermore, personal service providers, as defined, may not qualify as SBC. The income from personal service limitation is meant to exclude the owners of lifestyle businesses, as outlined in the NDP. This is apparent from the first issue of IN 9 (2002), which stated that SBC dispensations are not intended to benefit any professional person. The exclusion of professional persons is achieved through the personal service definition that appears in section 12E(4)(d).

Interpretation of the definition of personal service has been the subject of debate, as illustrated in XYZ CC vs Commissioner of the South African Revenue Service (2012), wherein the Commissioner disputed a close corporation's status as a SBC on the grounds that more than 20% of the corporation's receipts and accruals constituted income from consulting services. During the case, the fifth iteration of IN 9 (2009) was

in issue, which stated that the ordinary and grammatical definition of each of the fields listed in the personal service definition applies. Thereafter, it stated that each term is “to be construed in their widest possible sense” (IN 9, 2009). The presiding judge however disagreed with the Commissioner’s stance that the widest interpretation applied to ‘consulting services’. Consequently, the prevailing ruling is that the ordinary or dictionary definition of words be applied in the personal service definition. Note, however, that this was a Tax Court case, and therefore not binding legal authority.

The seventh issue of IN 9 (2018) does not adjust its guidance on the definition of a ‘personal service’ despite this ruling. The 20% limitation of personal services as a business activity is also questioned in the DTC’s SME report (DTC, 2014). It is established that s 12E is not intended to benefit professional persons (IN 9, 2002). Despite this, however, the DTC’s SME report highlights that 34% of businesses that receive s 12E allowance are within the fields of insurance, finance, real estate, medicine and veterinary sciences, meaning that professional persons (not the intended recipients of the incentive) disproportionately receive SBC incentives.

Thankfully, these personal service businesses only account for 3.5% of the SBC (Department of National Treasury & SARS, 2024). However, the legislature targeted professional persons with sound intent. The seventh and current version of IN 9 (2018) explains that these businesses are in the ambit of the SBC definition, in order to encourage employment.

The professions listed in the definition are only considered personal services to the extent that the person performing the service has an interest in the company and the company employs less than 3 full-time employees. Until issue 6 of IN 9 (2016), there was silence on the calculative nuances of this requirement. Since issue 6, it has been clarified a Rand-value apportionment of the income attributable to a shareholder’s involvement in the performance of a service is required in the calculation of the 20% limit. This amendment helps entities determine the percentage of services performed that are “personal services”.

Compliance considerations among small business corporations

To assess the impact and effectiveness of SBC allowances, compliance with taxation legislation is important (Gale & Brown, 2013). According to Kamleitner, Korunka and Kirchler (2010), SME owners lack meaningful tax knowledge, perceive more non-compliance opportunities than salaried employees, and are more likely to frame taxation as a painful loss. This concurs with OECD research that flags small business owners as a high-risk group of taxpayers in terms of non-compliance (Kamleitner, Korunka & Kirchler, 2010).

The cost of tax compliance is a perceived challenge to small business owners. A significant portion of total compliance expenditure in SMEs is attributed to tax compliance (Tlhomola, Rankhumise & van Niekerk, 2010), and these costs are regressive in nature, meaning that the cost of compliance is a greater burden to smaller businesses (Smulders & Stiglingh, 2008). Moreover, the complexity of tax systems is a challenge in respect of compliance for small businesses (Abrie & Doussy, 2006).

Smulders and Stiglingh (2008) aimed to quantify the cost of compliance for SMEs in South Africa. They found that, on average, tax practitioners charge SMEs an annual fee of R7 030, which in today’s terms would be a conservative estimate.

The apparent risk of non-compliance and the burdensome cost of compliance with tax legislation among SMEs suggests that various entities may, intentionally or erroneously, understate and misreport their tax liabilities (Abdul-Jabbar, 2009). This may be due to a lack of resources (Rabie, Cant & Wiid, 2016). If non-compliance is rife among SMEs, any incentive aimed at supporting SBC will be ineffective due to the possibility of misuse of the tax system. Moreover, s 12E can only be considered effective if SBC are aware of and use the allowance. While older research, Abrie and Doussy (2006) highlight that 42% of SMEs are aware of s 12E but only 18.7% use the allowance. However, they classify SMEs based on their number of employees and therefore the entities surveyed may not be representative of the SBC population – which justifies the lack of use and awareness of s 12E. Despite the shortcomings in Abrie and Doussy (2006), however, it is doubtful whether SMEs are aware of and utilise the accelerated allowance available in s 12E. Furthermore, non-compliance risks suggest that SMEs may not conform to the provisions of s

12E. Hence, the impact of accelerated allowances is potentially diminished due to non-compliance and lack of awareness.

Asymmetry of profits and losses

For s 12E to be an effective allowance, a taxpayer must have taxable income from which accelerated allowances can be claimed. The asymmetry of profits and losses with regard to taxable income dictates that entities with taxable income may claim allowances, while businesses in assessed taxable loss-making positions cannot (Freedman & Crawford, 2011). Furthermore, it is argued that this asymmetry limits the ability of intended recipients to benefit from the allowance (DTC, 2014) when these businesses in loss-making positions are possibly more worthy recipients thereof.

The asymmetry of profits and losses means that profitable entities derive a greater benefit from the allowance than those without any taxable income. This prevents s 12E from targeting all intended recipients of the incentive. As of December 2023, 40% of qualifying SBC have assessed losses or zero taxable income (Department of National Treasury & SARS, 2024). Thus, almost half of qualifying SBC cannot utilise the accelerated allowances in s 12E, and only 88 457 entities can receive accelerated allowances.

The role of SMEs in growth, employment and transformation

The s 12E allowance is a taxation policy intended to aid small businesses. The rationale for policy intervention (such as s 12E) that supports the SME sector is rooted in the premise that SMEs have a great capacity for job creation, growth and poverty reduction. Therefore, in determining whether such policy meets its intended purpose, this notion must be interrogated.

SMEs as a driver of growth and employment creation

Tax incentives were introduced to support SMEs, based on the belief that smaller firms offer higher growth and employment creation prospects. However, in developing nations, there is uncertainty about the link between firm size and job creation. Ayyagari, Demircuc-Kant and Maksimovic (2014) found that small firms contribute the largest share of job creation in developing countries – even after controlling for firm age. However, de Kok, Deijl and Veldhuis-Van Essen (2013) show that SMEs are not role-players in both job creation and economic growth in developing countries. They state that SMEs play a more significant role in job creation than larger enterprises, but there is uncertainty about the contribution of other employment sources to job growth.

The relative size of the SME sector in terms of contribution to employment and GDP is often cited as justification for policy interventions relating to SMEs. SMEs employ the vast majority of the South African population and account for more than 50% of South Africa's Gross Domestic Product (GDP) (Petersen, Bruwer & Mason, 2020). However, this is not an indicator of employment creation and growth, as there is no causal relationship between the SME sector's share in an economy and economic growth (Ayyagari, Demircuc-Kant & Maksimovic, 2014). Furthermore, with an average lifespan of 3.5 years and a failure rate of 70%, many South African SMEs do not survive to create employment and growth (Bureau for Economic Research, 2016). Moreover, most South African SMEs are survivalist businesses that are less likely to grow and transition into the formal economy (Bureau for Economic Research, 2016). As a result, the propensity for South African SMEs to create jobs is dubious.

Given the literature and statistics, the assertion that small businesses are a source of employment creation and economic growth in South Africa should be explored. At present, the link between firm size and growth is questionable, and it is plausible to state that allowances targeting SMEs will be ineffective.

SMEs as a driver of transformation and poverty reduction in South Africa

The promotion of transformation to correct the historical injustices of apartheid is an important policy consideration in South Africa. Accordingly, the role of SMEs in transformation and poverty reduction must be evaluated. SMEs are seen as a mechanism to lift South Africans out of poverty and to promote inclusion in the economy, as they employ most of the labour force in South Africa (Bhorat et al., 2018). The

SME sector has the capacity to promote transformation, as 71% of SME owners are black (Bureau for Economic Research, 2016).

Agupusi (2007) and Maksimov, Wang and Luo (2017) recognise that informal SMEs in low-income areas offer the greatest capacity to alleviate poverty, as they support and employ the poorest members of society. The Bureau for Economic Research (2016) corroborates this proposition. As of 2015, 51% of SMEs in the formal sector are white owned and operated, while black ownership of informal SMEs is measured at 89%. Agupusi (2007) contends that informal businesses face various challenges that limit their ability to diminish poverty, and de Kok, Deijl and Veldhuis-Van Essen (2013) state that wages paid to employees of SMEs are insufficient to alleviate poverty in developing nations. Furthermore, government policies largely benefit formal businesses, with lack of support for informal entities (Agupusi, 2007).

SMEs do offer potential to alleviate poverty and enhance transformation. However, it seems that governmental policies such as s 12E cater for formal entities and neglect informal businesses that offer the most potential for transformation and poverty reduction. Thus it seems that s 12E cannot successfully promote inclusive growth.

The effectiveness of tax incentives as a policy intervention tool

Taxation incentives can be used to assist SMEs. Therefore, to evaluate the effectiveness of s 12E the relative impact of tax allowances on SMEs, as compared to other tools, is worth assessing. International research suggests that the use of tax incentives to stimulate SME growth is limited. However, when used with direct subsidies, tax incentives do stimulate output in SMEs (Radas *et al.*, 2015). Thus, a tax incentive appears to be an effective policy tool when coupled with direct subsidies – although local research is needed to corroborate this.

The refundable compliance rebate

In their SME report, the DTC interrogated the collective effectiveness of various SME tax incentives – especially s 12E and concessionary tax rates for SBC. As part of their recommendations, the DTC's SME report suggests the removal of accelerated allowances (as afforded in s 12E) and concessionary tax rates, to make way for a refundable compliance rebate. The possible impact of the proposed rebate is now discussed.

Loss of accelerated allowances

Section 12E is meant to encourage investment in capital assets in SMEs, as it offers an increase in future cash flows of potential investment projects (Kitchen & Knittel, 2016). The proposed compliance rebate will not directly stimulate capital accumulation in the same way as an accelerated allowance, as it will not be considered in future cash-flow projections of investment projects. However, the impact of accelerated allowances is thought to be minimal (DTC, 2014). Businesses that do not qualify as SBC receive allowances on capital assets in sections 12C and 11(e). The allowances under s 12E are accelerated versions of 12C and 11(e). Consequently, s 12E merely offers a timing difference in allowances to SBCs.

The DTC's SME (2014) report reveals the minimal impact of accelerated allowances by highlighting that claims under s 12E amount to about R220 million a year. This amounts to about R4 462 per qualifying SBC, and thus the relinquishment of an accelerated allowance will not be detrimental to SBC owners, as its current benefit is negligible. Furthermore, the Bureau for Economic Research (2016) quantifies the total SME population at 2 251 821 businesses, meaning that accelerated allowances are afforded to only 2.2% of SMEs.

Enhanced equity under a rebate

The s 12E allowance is calculated on the cost of assets owned. Hence, larger or more capital-intensive businesses receive the greatest benefit from the allowance. A uniform rebate is however more equitable in that its benefit will carry more weight for smaller SMEs (Batchelder, Goldberg & Orszag, 2006). Moreover, compliance costs are more burdensome for smaller businesses (Smulders & Stiglingh, 2008). Therefore, a refundable compliance rebate offers a solution to an existing constraint faced by smaller SBC. As tax

compliance is an established and significant burden for SMEs, targeted support that directs this problem would be welcomed by small business owners.

Assisting with and incentivising compliance

The compliance rebate is intended to incentivise compliance with taxation legislation by SBC (DTC, 2014). As small businesses are a high-risk group in terms on non-compliance, increasing voluntary compliance is worthwhile (Kamleitner, Korunka & Kirchler, 2010). Assistance with compliance may also lead to higher tax revenues from the SME sector.

Dissenting views on the rebate

In the 2014 Draft Explanatory Memorandum to the Taxation Laws Amendment Bill, there was a proposal for a refundable compliance rebate of R15 000, but tax practitioners considered this inadequate. The loss of concessionary tax rates to SBC coupled with the introduction of a refundable compliance rebate would result in an increased tax bill in certain circumstances (Explanatory Memorandum to the Taxation Laws Amendment Bill [Draft], 2014). More specifically, larger SME tax bills may increase due to the loss of concessionary tax rates. However, the replacement of the concessionary rates and accelerated allowances with a rebate benefits smaller businesses with lower taxable income – thus achieving a more equitable outcome. However, the importance of SMEs in economic growth, employment creation and transformation appears to be overstated, and thus tax allowances that reduce the tax bill of SBC are unsubstantiated and do not achieve their intended purpose. Moreover, the purpose of the refundable compliance rebate is not meant to reduce the tax liability of all SBC, but rather aims to assist SBC with tax compliance. Smulders and Stiglingh (2008) found the average cost of compliance was R7 030. Thus, R15 000 will adequately reimburse SBC for tax compliance costs, even if inflation since 2008 is accounted for.

Functioning of a rebate for businesses without taxable income

Due to the asymmetry of profits and losses, entities can only claim a rebate to the extent that they have available taxable profits. Therefore, a rebate as opposed to an allowance cannot increase the coverage of s 12E. However, the impact problem can be improved by carrying forward any unused portion. Section 6quat of the Act affords South African taxpayers a rebate for taxes paid to a foreign government that can be carried forward to the next year of assessment if the taxpayer does not have sufficient tax payable against which to offset the rebate. Thus the proposed refundable compliance rebate should contain a similar ‘carrying-forward’ provision to include businesses that have incurred taxable losses.

Recommendations

Based on the evidence, recommendations to enhance the effectiveness of s 12E include:

- i. Firstly, that the ‘natural shareholding’ requirement should be replaced with some form of corporate shareholding limit in SBC to allow investment from institutions such as venture capitalists. The DTC (2014) suggested an appropriate limit of 33.3%.
- ii. Secondly, in order to simplify the SBC definition, provisions dealing with corporate shareholdings should be replaced with a provision stating that “all SBC shareholders may not hold an interest in any other SBC”. This will prevent taxpayers splitting their income amongst various SBC to avoid taxation.
- iii. Thirdly, to increase the coverage of s 12E and to achieve consistency with the DTI’s classification system, the gross income limitations should follow the DTI’s lower limits in classifying small and medium entities. This will increase the coverage of s 12E as the DTI’s limits are mostly higher than R20 million, and will help tailor size requirements in each economic sector.
- iv. Fourthly, the sentence explaining the “wide interpretation” of the professional services listed should be removed from IN 9. This is in line with the prevailing court ruling, and would still encourage employment in the SME sector. A more informative alternative, albeit restrictive regarding the use of s 12E, would be to include explicit guidance on the breadth of the personal services listed, or to expand the list.

- v. Lastly, the accelerated allowance should be replaced with a refundable compliance rebate, and the rebate should allow disallowed portions to be carried forward to future years.

Conclusion

Employment creation, economic growth and poverty reduction are critical in South Africa. A thriving SME sector is a perceived solution to these problems. In light of this, the plight of SMEs has garnered political support that has led to public policy initiatives to promote this vital cause.

The NDP (2011) envisions a diverse and inclusive economy wherein small entrepreneurial businesses are supported through policy interventions, and they in turn will create jobs and employment. However, the role of small businesses in job creation is unclear, as there is no clear link between firm size and employment creation. This suggests that policies such as s 12E aimed at incentivising small businesses may not be reaching their target. Furthermore, entrepreneurial enterprises in low-income areas are neglected by government policies and legislation, as they are informal. As these businesses are potential proponents for inequality reduction, s 12E is not achieving its purpose of transformation and poverty reduction.

Section 12E and IN 9 are intended to aid entrepreneurial businesses. However, the SBC definition does not directly target such businesses in South Africa. Consequently, institutional investors should be allowed to hold shares in a SBC (up to a certain limit), and complex provisions of corporate shareholding should be simplified. In addition, the impact of s 12E is limited, as many small businesses are at a high risk of non-compliance with tax laws, are possibly unaware of the allowance, and have assessed losses. The effect of these inhibiting factors is clear – as only a small percentage of SMEs utilise accelerated allowances.

Although s 12E is not meeting its intended purpose, taxation compliance is a significant challenge for small business owners. Furthermore, as SMEs are a significant contributor to employment, GDP and possibly transformation, a targeted rebate to assist with tax compliance is justified. The proposed refundable compliance rebate of R15 000 is equitable, as it benefits smaller firms that require assistance with compliance in greater proportions. Furthermore, the amount of the rebate will cover the average estimated costs of compliance for SMEs in South Africa.

Considering the extent of poverty, unemployment and inequality in South Africa, effective state intervention is vital – and as SMEs contribute significantly to production and employment, tax incentives directed to this sector must be effective. That said, this study demonstrates that s 12E is not stimulating investment, growth and job creation as intended. Greater targeted support in the form of a refundable compliance rebate is thus presented as a solution for SMEs in South Africa.

Limitations of the study and areas for future research

Section 12E and IN 9 are considered in isolation relative to other allowances and policy tools. The performance of small businesses and their capacity to create jobs is linked to the macro economy and the regulatory framework in South Africa, and the study is limited in its discussion of how these variables impact SME growth.

The cost of the recommendations is not considered in this study. In the DTC's SME report, the replacement of concessionary rates and accelerated allowances with a refundable compliance rebate was found to be affordable (DTC, 2014). However, due to the proposed changes to the SBC definition in this study, the number of businesses receiving the proposed rebate should increase.

Further research in South Africa could include, firstly, providing further insight into the link between SMEs, employment creation and economic growth. Secondly, probing the role of SMEs in transformation and poverty reduction. Thirdly, a broader investigation of the impact of all tax incentives on the SME sector. Fourthly, and lastly, a more detailed probe into the cost of compliance and risks of non-compliance for SMEs.

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A new practical based pedagogy approach to overcome weaknesses of traditional approaches at classroom environment

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Keywords

Pedagogy approaches, practical approaches, teaching methods, teaching techniques, teaching styles and PAWLIT technique

Abstract

Effective, high-quality teaching depends on selecting appropriate teaching methods and techniques that meet students' diverse needs and support them in achieving learning objectives. Due to ambiguity in pedagogical terminology and inconsistent use of instructional methods and techniques continue hinder teaching quality and effectiveness. Sometimes, teachers/lecturers struggle to select appropriate teaching strategies, methods and techniques, or use traditional methods and techniques that lead their lessons ineffective. Traditional pedagogical approaches, which are sometimes suitable for young learners or more dependent learners, may be ineffective when applied across diverse learning contexts. One of the most frequently used methods, traditional lectures with PowerPoint slides are not effective for dependent students in the classroom, which disengage them and limit their active participation. Therefore, it is essential to critically evaluate of established teaching strategies, approaches, methods and techniques and refine them, as well as to develop new ones to support diverse learners and active participation, and enhance the overall learning experience and teaching quality. This paper presents the Practical Approach with Lecture, Image and Text (PAWLIT), as a potentially effective teaching technique for improving learner engagement and achievement, as well as quality in the Further and Higher Education. PAWLIT combines lecture, visual and textual elements to address challenges over teaching approaches, methods and techniques. This paper illustrates strengths and weaknesses of traditional pedagogy approaches and practices, and proposes a new technique, PAWLIT to apply across all learners including dependent and independent learners for overcoming weaknesses of traditional approaches and enhancing pedagogical culture and practices across the organization. It is anticipated that the PAWLIT technique will stimulate further discussion and research on the effective use of both classroom and online resources in in diverse learning environments.

1. Introduction

The most important task for teachers/lecturers is to select and use the suitable teaching techniques to make lessons effective and support students in achieving learning objectives. Dynamic student participation, the use of active teaching strategies, and the development of students' critical thinking skills are essential for lecturers, but confusion with different pedagogical terminologies and the use of ineffective or outdated teaching methods and techniques make their teaching more challenging and ineffective.

Most traditional teaching follows a one-way, passive approach, where lecturers deliver lecture-based information only to students. Modern pedagogies teaching overcomes the weaknesses of traditional teaching, but they are not always effective across all learning environments. Many researchers (Bidabadi, et al., 2016; Yli-Panula et al., 2018; Sivarajah et al., 2019; Strubbe et al., 2020) recommend small group discussions as one of the most effective teaching strategy for fostering critical thinking in disciplines such as business, law, philosophy, and politics. However, this strategy may not be as effective in STEM (Science, Technology, Engineering and Mathematics) fields, where practical, hands-on, and visually supported approaches often yield better learning outcomes than discussion. Professional teachers/lecturers should know and/or discover, through reflective practice, which teaching strategies and techniques are appropriate for their teaching environments. This highlights the essence of evaluating existing teaching methods and techniques, as well as proposing and assessing new ones.

In response to these challenges, this research evaluates the limitations of traditional pedagogical methods and proposes the Practical Approach with Lecture, Image and Text (PAWLIT) technique for adult learners in Further and Higher Education for effective teaching culture. PAWLIT integrates visual, textual, and interactive components to better support diverse learning contexts and needs. A few teaching professionals and some students have evaluated it for high achievement in a learning environment, which helps students learn individually and/or collaboratively and enhances their experiences. The PAWLIT may be a more effective and efficient teaching technique for particular subjects such as computing and engineering, but it needs to be evaluated and tested by many students and teaching professionals in different learning contexts.

After this introduction section, the paper is organised into five sections. Section 2 defines key teaching terms and discusses them in detail to avoid misunderstanding and ambiguity among teachers/lecturers. Section 3 reviews the literature to examine the limitations of traditional teaching methods and approaches, highlights the importance and effectiveness of selecting appropriate teaching methods and techniques, and discusses strategies for enhancing students' engagement and learning outcomes. Section 4 introduces the new PAWLIT technique to address the gaps identified in the literature, and presents its methodology and implementation in two different educational settings, along with a discussion of the findings. Section 5 outlines the limitations of this research and its implications, and Section 6 concludes the paper.

2. Key teaching terms – pedagogy, andragogy, theory, approach, method, technique, strategy, style and tool

There are many teaching terminologies such as pedagogy, andragogy, approach, method, technique, strategy and tool. In academics, pedagogy and andragogy are the two broader teaching approaches, based on educational theories, where pedagogy is used for teaching children, young people and dependent learners, and andragogy is used for adults for collaborative and self-directed learning. There is also another term, Heutagogy approach, which can be used to teach interdependent learners, where they use their own and others' experiences and become proactive as well as problem-solvers. Teaching theories and teaching approaches are interrelated: teaching theories explain why learning occurs, and teaching approaches describe how these theories can be implemented in practice (Eggen & Kauchak, 2015; Schunk, 2012).

A teaching theory provides information on how teaching works and how it can affect learners' learning. For example, Bloom's Taxonomy, Growth mindset, flipped learning, Meutic theory and social learning theory are some of the popular teaching theories. Bloom's Taxonomy is one of the most powerful teaching theories or frameworks for teachers to meet students' needs and plan their lessons to manage classroom time (Krathwohl, 2002). Flipped theory opposes traditional lecturing; a reversal role between teachers and learners takes place, where learners learn new materials before class or outside classrooms and apply the new concept in the classrooms through discussion and problem solving (Ettien & Toure, 2023). The teaching theory of Meutic conceives that questioning techniques help learners recollect or unfold their knowledge. The social learning theory emphasises the role of observation, imitation, and modelling in learning, suggesting that much of human learning occurs through observing and imitating others, particularly role models or peers (Bandura, 1972).

A teaching approach refers to the broad and general principle, philosophy or framework that guides how teaching and learning will be constructed. It gives overall wisdom, direction, and expectations of the entire teaching process (Nasiba et al., 2021). Two broad approaches are student-centred and teacher-centred. The student-centre approach emphasises active participation, adaptation to needs, autonomy, relevant skills, power sharing and formative assessment of students in their own learning process, such as inquiry-based learning and discovery learning (Bremner, 2021). Another teaching approach, teacher-centred, focuses on the teachers as primary sources of knowledge, while students are passive receivers of information, such as traditional lecture-based teaching. Other widely recognised teaching approaches include constructivism, behaviourism and Humanism. A teaching methodology is a set of principles,

beliefs, or ideas, and techniques about classroom teaching that provides a narrow and specific vision of how learning occurs and implements a particular teaching approach to benefit students. Using teaching approaches, a teacher sets general rules or principles for delivering teaching. Examples of teaching approaches – cognitive refers to thinking, remembering and maximising the brain's potential; behaviourist refers to learners who learn through reinforcement and constant feedback; and constructive refers to learners constructing their own knowledge through negotiation, interactivity and collaboration.

A teaching method is an organized, orderly, structured and planned procedure to enhance learners' learning and experiences. The teaching methods used in the classroom depend on learners' needs, abilities and interests, as well as the requirements of the curricula. Sometimes, methods are employed by the teacher to achieve certain aims.

A teaching strategy is a set of methods or teaching activities, or an overall plan or approach that teachers use to deliver lessons, keep students engaged, and practise skill sets for achieving a specific goal or series of goals. Teaching strategies can be broken down into two broad categories – active and passive. An active teaching strategy gives more hands-on knowledge and skills through doing, while a passive teaching strategy allows students to learn on their own through reading, listening, or researching (Sinha, 2025). Teaching strategies can take different forms, such as inquiry-based, project-based, game-based, collaborative, experiential, and blended learning.

A teaching technique is a specific, or step-by-step, or actionable method within the teaching strategy to deliver a lesson or complete an activity for achieving objectives in a specific learning environment. In the classroom, a teacher uses a wide range of teaching strategies to meet all the needs of students, and which strategies should be used depends on the subject area and course requirements. Teaching techniques are the specific tools and activities that are used by a teacher to facilitate students' learning. A teaching technique reflects an individual teacher's unique approach and personal style, enabling them to develop, design, and implement instructional procedures or methods. Even when employing the same method, teaching techniques may vary from one teacher to another, highlighting the personalized nature of instructional delivery. For example, a learning technique could be a brainstorming, through which a variety of ideas can be generated and shared; concept mapping, which involves drawing graphical representations to highlight students' understanding and organization of conceptual structures; and role-playing, which can emphasize active learning in collaborative and experiential learning situations (Evangeolou, 2023). The implementation of a teaching technique in the classroom to achieve specific objectives depends on the teacher's knowledge, skills, and the learning environment. For instance, one teacher might implement the brainstorming technique by asking each student to individually generate a few ideas related to a given problem, drawing on their own strengths and prior experiences with the topic. In contrast, another teacher might encourage students to work in small groups, promoting collaborative discussion to generate and refine ideas collectively.

A teaching style refers to a teachers overarching approach or philosophy to instruction, influenced by their personality, beliefs, and perspectives on how students learn. A professional teacher uses a few different teaching styles in classrooms to meet students' needs. A few of the most popular teaching styles are authority or lecture style, demonstrator or coach style, facilitator or activity style, delegator or group style, and hybrid or blended style. For a teaching style, a teacher may need to apply one or more teaching techniques in classrooms depending on the teacher's teaching styles (McCoy, 2018).

A teaching tool is an object or technology that a teacher uses to facilitate learning and help students acquire knowledge and skills. Teaching tools depend on the subject and the needs of the students, and can include textbooks, computers, laptops, interactive or smart boards, interactive games, hands-on activities, multimedia and digital platforms. Modern teaching tools in classrooms can enhance students' cognitive abilities, critical thinking and problem-solving skills (Majewska, 2018).

Apart from teaching styles and tools, teachers should also consider learners' learning preferences: how they prefer to receive, process and engage with teaching content to deliver a successful lesson. For student to student, these preferences can vary widely, including visual, auditory or kinaesthetic (VAK) models of learning, as well as collaborative and independent learning style. A teacher should select appropriate teaching strategies, methods, techniques, and tools, prioritising their preferences to enhance their learning goals.

In other words, teaching theory informs and shapes teaching approaches, which serve as a foundational framework for the development of teaching methods. These methods, in turn, give rise to specific teaching strategies, which are ultimately operationalized through distinct teaching techniques. Teaching techniques are influenced by various factors, including the teacher's teaching styles, students' learning preferences, and the tools or resources available in the teaching environment. Figure 1 illustrates the relationships among different teaching terms and how they are distinct from one another.

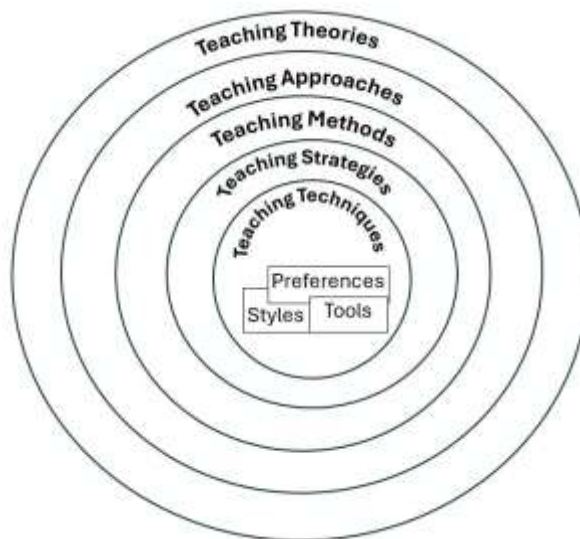


Figure 1: Relationships among different teaching terms and their distinctions

3. Literature reviews

Many literature reviews have raised doubts that traditional pedagogy approaches are not always effective in preparing students for the challenges of the 21st century. However, although the main focus in some subjects, such as mathematics, physics, and other sciences, is on calculation and comprehension, traditional lecture-style teaching can still be beneficial for students (Schwerdt & Wuppermann, 2011). For many other educational fields, including computer science and business, modern teaching methods such as discussions, simulations, case studies, educational games, and concept maps are very effective for developing students' problem-solving skills, cognitive and social skills, as well as critical thinking, and promoting active learning and collaboration (Farashahi et al., 2018; Hazzan et. al., 2011). These modern teaching methods emphasize the use of technology to meet the needs of the education system while adapting to each student's unique needs, interests, and learning styles, rather than assuming a uniform level of understanding or requirement for all students.

Sometimes teaching professionals use the terms - teaching method and teaching technique interchangeably, and they are confused due to the overlapping nature of these terms and their contextual variability. Teaching methods are highly aligned with educational philosophies and models (Biggs & Tang, 2011). Due to the highly dynamic nature of the educational context, a professional teacher may need to apply multiple teaching techniques for a particular teaching method, creating ambiguity. Understanding all teaching terminologies, particularly teaching method and teaching technique, helps them implement effective strategies to enhance student learning outcomes.

For effective teaching, it is essential to focus on how to teach, rather than solely on what to teach, within the classroom contexts. How to teach refers to which teaching methods are used, how to interact with students in classrooms and how to give feedback (Dilekli & Tezci, 2016). Aktan (2012), Grasha (2002) and Baron (1993) argued that how to teach closely related to teaching professionals' self-efficacy and teaching styles. Teaching techniques depend not only on teachers' self-efficacy and teaching style, but also on teaching methods and specific teaching environment, which also add complexity and ambiguity. For example, teaching techniques such as a particular activity may be suitable for one course, but may not be

effective for another. A professional teacher may need to apply one or more additional activities as teaching techniques depending on students' learning styles and classroom contexts.

Professional teachers/lecturers should assess and identify which teaching methods should be used according to students' needs, teaching goals and objectives, and potential barriers (Wang, 2022). Many researchers suggest that, especially in higher education, a brief survey can be conducted before starting a course to determine what students need to learn and which teaching methods they prefer. Interaction with students can be increased or decreased based on the results of reflection and practice. Students learn more effectively when their chosen teaching methods, learning preferences, and relevant tools are aligned with their needs in the classrooms (Mazarin, 2021).

4. Proposed a new teaching technique – Practical approach with lecture, image and text (PAWLIT)

4.1 Introduction

A **Practical Approach with Lecture, Image, and Text (PAWLIT)** is an active teaching strategy designed for targeted educational contexts. Rooted in a student-centred pedagogy, this approach effectively enhances teaching and learning outcomes, particularly among Further Education (FE) and Higher Education (HE) students. PAWLIT addresses and mitigates several limitations associated with traditional teaching methods, promoting deeper engagement and comprehension.

The technique can be introduced through a simple example using Figure 2. In a traditional teaching approach, when introducing a new item, such as an apple, the teacher typically draws an image and writes it on the board, demonstrating its pronunciation and spelling. The PAWLIT is a novel, efficient techniques that combines three components – lecture or speech, image and text with or without technologies to enhance engagement and learning outcomes. Figure 2 shows the difference between the traditional method and the PAWLIT teaching application using the topic of “apple”.

Using PAWLIT, a teacher can display an apple in various colours (e.g., green, red, pink, and yellow) to stimulate students' visual senses. Additionally, the teacher provides a concise textual and auditory description of the item, reinforcing the word's pronunciation and spelling to enhance learning and better engage students. How the technique will be used in an environment depends on the availability of tools or resources, teacher's style and learners' learning preferences. For example, if there is no speaker option available, the teacher may read aloud the names of different apples, their spellings, and descriptions multiple times if necessary. Similarly, if technology or resource is unavailable, the teacher can draw several apples of different colours on the board, providing a caption for each.

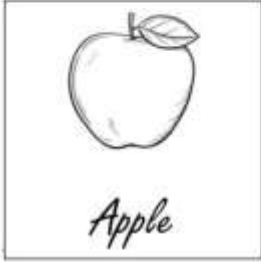
Traditional Method	PAWLIT Technique
 Hand drawing and writing 'Apple'	 (Green Apple) (Pink Apple) (Red Apple) (Yellow Apple) Description: An apple is a round fruit that grows on trees. Sound Spelling Description Students can see different coloured apples with textual Name, sound and text of Apple, Spelling and Description

Figure 2: Application of the PAWLIT technique within an ESOL English Skills for Life course

4.2 Methodology

The PAWLIT technique was grounded in empirical research, which involved the collection and analysis of limited data to assess educational outcomes across two distinct educational settings. In the first

setting, the PAWLIT technique was applied to a group of 30 adult ESOL (English for Speakers of Other Languages) learners, aged between 25 and 45, who were native speakers of various languages, including Bengali, Ukrainian, Arabic, and Portuguese. These learners were enrolled in the *English Skills for Life* course for Entry Level 1 (Elementary Level), at City College Stratford (London) and participated in a 12-week instructional period covering various topics from mid-September to mid-December 2024. In the second setting, the technique was implemented within two distinct modules of a degree programme: *Computer Science Fundamentals* (for first-year students) and *Advanced Databases and Big Data* (for second-year students). The total of 30 students were divided into three smaller groups and engaged with the material—primarily focused on Python programming—between February and March 2025 at Regent College London.

4.3 Implementation

For the implementation of PAWLIT technique within the ESOL Skills for Life course for Entry level 1, a prototype program was developed. Over a 12-week period, a series of weekly lessons were delivered, during which learners were introduced to a variety of thematic objects, including fruits, shapes, birds, and animals. Student feedback was systematically collected throughout the period to support the evaluation of the PAWLIT technique's effectiveness.

For the implementation of the PAWLIT technique within a degree programme, skeletal structures of two distinct Python programs—corresponding to two different modules—were developed in advance and delivered to three smaller student groups. Each program skeleton was initially presented as a visual image to introduce the upcoming content, outline its purposes and objectives, and stimulate students' visual engagement with the full program. Subsequently, programming syntax and scripts were introduced through lectures and textual information, and provided to students incrementally, allowing them to practice step-by-step rather than receiving the complete code at once. This scaffolded approach was applied to several Python programs, and student feedback was systematically collected to inform the evaluation of the technique's effectiveness.

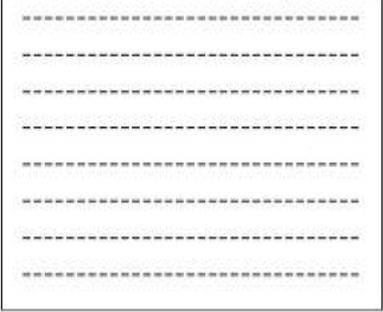
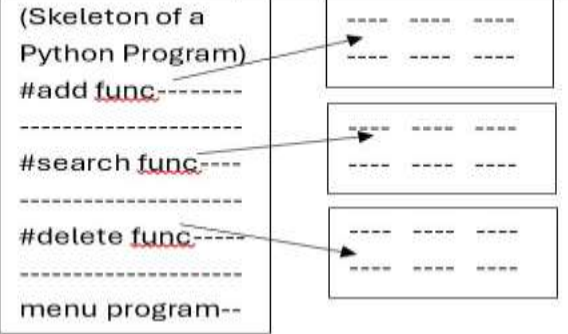
Traditional Technique	PAWLIT Technique
 Line by line long codes are written and explained thoroughly from the beginning to the end, and then it is running the full code to see results.	 Rather than writing many lines of codes directly, they are written as functions, implemented function by function with lecture and necessary instructions (Text), and then they are tested function by function (or part by part) as well interactively. Here the program skeleton is a visual instance for learners.

Figure 3: Application of the PAWLIT technique within a Computer Science Fundamentals module using Python program

Figure 3 illustrates how the PAWLIT technique was applied in the *Computer Science Fundamentals* module for first-year undergraduate students, alongside a comparison with the traditional teaching

approach. Instead of adopting a traditional approach that involved presenting complete, lengthy code blocks, the lecturer initially introduced a program skeleton in visual form, systematically showing different parts or functions of the program to enhance students' understanding of the entire program and actively engage them. The program was then progressively developed, explained, and tested in an incremental manner, typically function by function or part by part, to facilitate step-by-step comprehension and active student engagement.

4.4 Findings

Student feedback on the implementation of the PAWLIT technique in the *ESOL Skills for Life* course for Entry Level 1 was overwhelmingly positive across the 12-week period. Learners consistently reported improved and faster acquisition of new vocabulary related to objects, including their names, correct pronunciations, and brief descriptions. Many also noted enhanced recall, stating that they could retrieve information more quickly from memory. Additionally, most learners expressed that they found the teaching technique enjoyable and engaging.

Similarly, students enrolled in the degree programme reported that the PAWLIT technique was both effective and beneficial. They indicated that it facilitated a clearer and quicker understanding of complex programming tasks, enabling them to manage and comprehend lengthy code more efficiently. Most students actively engaged with the programming content and were able to follow the lecturer's pacing successfully. Many also remarked that they enjoyed the learning experience and praised the teaching technique for enhancing their learning.

The adaptability of the PAWLIT technique allows lecturers to tailor its resources to suit specific lesson contexts and learning environments, thereby optimizing educational outcomes. This flexibility represents a valuable asset for teaching practice and helps to avoid the weaknesses of traditional teaching approaches and methods. The teaching technique combines three elements – speech or lecture, text and images to create a lasting impact on learners' learning process. However, further evaluation involving a larger and more diverse student population is necessary to comprehensively assess the technique's overall effectiveness. Nonetheless, the PAWLIT approach demonstrates considerable promise in enhancing the student learning experience and supporting academic institutions in better addressing diverse learner needs.

5. Study limitations and implications

While the outcomes of the PAWLIT technique were largely positive across both educational settings, several potential limitations and challenges need to be acknowledged. First, effective implementation of this technique requires careful advance planning and the thoughtful selection of appropriate tools and resources to combine three elements – speech or lecture, text and images, and prepare lesson contents. Lecturers need to invest considerable time in designing activities, particularly in choosing suitable images and textual materials (including programming scripts, where applicable). If the selected materials are not contextually relevant or pedagogically appropriate, the technique may revert to more traditional teaching methods, thereby diminishing the intended benefits for students.

Moreover, the present study was conducted on a relatively small scale, involving limited cohorts in specific educational contexts. As such, the generalizability of the findings remains constrained. It is possible that applying the PAWLIT technique to larger or more diverse groups, or in different subject areas, may yield varied or even adverse results.

Despite these limitations, the technique shows significant promise for reinforcing the learning process. It highlights the importance of multimodal learning strategies and underscores the value of student-centred, active learning in both FE and HE. While this research demonstrates PAWLIT in ESOL English and selected Computer Science modules, the technique can be applied to other disciplines, such as business. Its three components – lecture or speech, image, and text – can be combined and tailored to suit specific lesson contexts and learning environments. Future research should explore the application of PAWLIT across broader and more varied educational settings to validate its effectiveness and scalability. Additionally, studies examining its impact on different learning styles and disciplines could offer further insight into how the approach can be refined and adapted to maximize its pedagogical potential.

6. Conclusions

Due to the dynamic nature of educational context and emerging technologies and tools, many researchers argue that evaluating teaching methods and techniques used in classrooms and developing new teaching strategies is a continuous process of educational development. Teaching methods provide a structured framework that help students achieve specific learning objectives. On the other hand, teaching techniques are specific actions or activities within the framework of broader teaching methods that facilitate students' learning, engage them and reinforce their knowledge. Finding the right teaching techniques for a subject is a challenging task, and professional teachers should continue to research and develop themselves.

The PAWLIT is a proposed teaching technique for subject areas such as ESOL and Computer Science. It has been applied and evaluated by a limited number of students, with very positive outcomes. This technique can be applied in selected subjects as a good practice for achieving effective teaching outcomes. Its combination of lecture, image, and text provides a flexible, multimodal framework that can enhance student engagement, achievement, and comprehension across diverse learning contexts. With further research and broader implementation, PAWLIT has substantial potential to transform pedagogical practices and serve as a model for student-centred, active learning in both FE and HE.

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From talent identification to retention: Embedding talent management for sustainable development in football

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Keywords

Talent Retention, Talent Management, Talent Identification, Human Resource Management, Talent Development, Football Academies, Player Sustainability, TMU, Performance Pathways.

Abstract

The process of transforming a promising talent into an elite individual extends far beyond the moment of discovery. While talent identification remains a foundational pillar in modern football and the business world, it is increasingly clear that talent retention represents the true test of an organisation's developmental integrity. Central to this continuum is Talent Management, a strategic, interdisciplinary function that links scouting outcomes to sustainable individual (player) progression.

This paper explores the interconnected roles of talent identification, talent management, talent retention within the football ecosystem, proposing a holistic framework that positions Talent Management as the operational and strategic core of individual development. Drawing on insights from earlier research in scouting systems and comparative development models, this study critiques the limitations of current practices, particularly within English football, and proposes an evolved model that ensures individual potential is not only recognised, but refined, protected and retained over time. In numerous professional environments, the absence of a dedicated talent management system results in high attrition, stagnated development and the premature exit of high-potential players. The causes are systemic: fragmented communication between departments, reliance on traditional HRM practices unsuited for high-performance contexts, inadequate psychological support, and failure to personalise development pathways. To overcome these gaps, the paper introduces the concept of a Talent Management Unit (TMU), a specialised, cross-functional entry that operates alongside but independently from standard HRM. TMUs are designed to coordinate individualised development plans, monitor psychosocial wellbeing, integrate performance data, and proactively manage retention risks.

The framework proposed rests on four integrated pillars: (1) Individual Development Pathways tailored to individual and psychological profiles; (2) Institutional Integration, ensuring that young talent adapts culturally and structurally into the organisation's (club's) ecosystem; (3) Performance and Wellbeing Monitoring, employing both data analytics and human-centred approaches; (4) Retention Strategy Alignment, which include career planning, mentorship, and succession mapping. This strategic model ensures that retention is not left to chance or short-term performance metrics but becomes a sustained organisational objective.

Moreover, this paper engages in a comparative analysis of English and European academies. While English clubs often enjoy world-class infrastructure and funding, they struggle with developmental continuity due to fragmented systems and reactive planning. Conversely, European clubs from Spain and Germany implement more cohesive talent pipelines, marked by early senior team integration, structured mentorship programs, and a shared strategic vision across departments. These systems demonstrate the practical value of structured talent management in driving long-term talent retention and success.

Talent management, in this context, becomes the critical differentiator between organisations and clubs that merely identify talent and those that develop and retain it through a systematic approach. The findings suggest that clubs that institutionalise TMUs and shift from a reactive HRM model to a proactive, talent-centric approach report higher player satisfaction, reduced dropout rates, and stronger long-term returns on investment in youth development. This research adopts a mixed-

methods approach, combining qualitative interviews with sports professionals, case studies, and longitudinal data analysis from selected clubs across Europe. The results validate the hypothesis that retention is not merely a coaching function, but a strategic outcome of integrated talent management.

In conclusion, this paper advocates for a paradigm shift in the way football organisations conceptualise and operationalise talent development. Talent should not be seen as a fixed attribute but as a dynamic potential that requires active, long-term management. Talent retention is a culmination of this process, and Talent Management is the mechanism that ensures that potential is not just discovered but fulfilled. By embedding TM into the structural fabric of football organisations, clubs can move from identifying to truly owning and growing their talent, ensuring competitiveness, stability and excellence.

Introduction

The world football industry is undergoing a complete transformation driven by data analytics, international talent mobility, and intensifying competition in player development (Relvas et al., 2010). In this evolving landscape, clubs are no longer defined solely by their ability to scout promising players but increasingly by their capability to develop, manage, and retain that talent within sustainable performance systems. Talent identification (TI), the process of recognising potential in athletes based on performance metrics and predictive indicators, has received considerable attention in recent years (Vaeyens et al., 2008). However, what often remains underdeveloped in both research and practice is the strategic continuum that follows identification: talent retention (TR).

Retention is not a passive outcome of talent recognition. It is an active, deliberate, and structured process involving alignment between the individual's development and the club's strategic goals, combined with robust support systems that ensure both performance sustainability and psychological wellbeing (Meyers, van Woerkom and Dries, 2013). The transition from identification to retention cannot occur in isolation. Furthermore, it requires the integration of Talent Management (TM, a strategic, interdisciplinary framework that connects early identification to long-term career development (Collings and Mellahi, 2009).

In many football organisations, the post-identification phase is either diffusely managed across technical departments or handled through extemporaneous processes. Human Resource Management (HRM), while traditionally responsible for staffing and contracts, lacks the performance and athlete-specific expertise to manage the dynamic requirements of high potential individuals (Taylor and McGraw, 2006). This creates significant developmental discontinuities and often results in underutilised potential, premature exits, and low retention rates (Rongen et al., 2018).

This paper theorises that effective talent retention requires a dedicated, systematic approach to talent management. It advocates for the creation of Talent Management Units (TMUs), specialised cross-functional departments responsible for managing individualised development plans, monitoring performance and wellbeing, integrating athlete support services, and proactively managing progression and retention.

TMUs differ from traditional HRM in that they are designed to operate within high-performance environments with a dual focus: athletic-centric development and organisational sustainability (Ashton and Morton, 2005).

Comparative evidence between German, Spanish and English football academies highlights how structurally integrated TM practices directly affect retention outcomes. German and Spanish clubs, often more unified in their development philosophies, integrate coaching, psychology, and education into a cohesive pipeline that facilitates smoother progression to senior teams (Relvas et al., 2010). In contrast, English clubs, despite their infrastructure advantages, often lack this alignment, resulting in fragmented pathways and talent loss (Bridge and Toms, 2013).

Furthermore, in the context of globalisation, where elite youth talent is aggressively pursued across borders, retention becomes a competitive differentiator. Clubs that can provide structured, supportive, and transparent development journeys are more likely to retain players and realise long-term return on investment (Dries, 2013).

In conclusion, Talent Management is the strategic bridge between identifying potential and realising performance. By embedding TM into the club's institutional framework, through TMUs, cross-functional planning, and athlete-centred policies, organisations can mitigate talent loss, enhance developmental continuity, and ensure long-term success in a highly competitive sports ecosystem.

Literature Review

Integrating Talent Identification, Retention, and Management in Football Development Systems

The body of literature on athlete development has traditionally emphasized talent identification (TI) as the foundation for building elite sports performance pipelines. Talent identification refers to the systematic process of recognising young athletes with the potential to achieve high levels of performance based on physiological, psychological, technical and tactical characteristics (Vaeyens et al., 2008). However, there is growing recognition that talent identification alone is insufficient for long-term success. Talent retention (TR), the capacity to support, develop, and sustain athletes beyond the point of discovery, is increasingly regarded as a critical outcome in the athlete development lifecycle (Meyers, van Woerkom and Dries, 2013).

A review of literature discloses that Talent Management (TM) is the missing link that bridges identification and retention. TM includes strategic practices that coordinate individual athlete development, align support systems, manage performance risks, and ensure institutional continuity (Collings and Mellahi, 2009). This literature review synthesizes findings across talent pathways, football-specific studies, and broader organisational research to demonstrate how TM, when implemented through structures such as Talent Management Units (TMUs), can significantly improve athlete retention, satisfaction and performance sustainability.

Talent Identification – Progress and Limitations

Recent advancements in scouting methods have expanded the reach and effectiveness of talent identification. Data analytics, video analysis, and performance modelling have become central to modern scouting departments (Reilly, Williams and Richardson, 2003). These methods offer more objective tools for assessing player potential, especially when applied longitudinally.

This paper emphasizes the importance of synthesizing global scouting systems, drawing comparisons between English, German, Spanish and South American practices. The research illustrates that while English academies have strong financial and technical infrastructure, they frequently fall short in creating consistent developmental outcomes due to fragmented organisational approaches.

Moreover, early selection bias remains a major concern in TI (Talent Identification) literature. Vaeyens et al., (2008), and Bailey and Collins (2013) argue that many systems over-selected based on early physical maturation, overlooking late bloomers with greater long-term potential. These biases are often reinforced by performance environments that prioritise short-term success over developmental integrity. Without a long-range view, even well-identified talent can be derailed by premature pressure or developmental stagnation (Cobley et al., 2009).

Talent Retention – The Strategic Continuum

Where TI (Talent Identification) stops, TR (Talent Retention) must begin, but in many systems, that handover is poorly defined. Talent retention refers to the club's ability to keep identified players engaged, supported, and developing through youth and into senior levels (Meyers et al., 2013). In practice, retention is often undermined by miscommunication between departments, lack of psychological support, and limited long-term planning.

This research paper advances this conversation by proposing a formal framework that integrates four key components: Individualised development trajectories, performance monitoring, cultural and institutional embedding, and embedded psychological profiling. This framework reflects the growing consensus that retention is not a one-size-fits-all function, but a dynamic and contextual process. Rongen et al., (2018), emphasize that retention should consider not just performance outcomes but personal growth, wellbeing, and long-term integration into a club's philosophy.

Case studies from German and Spanish football provide strong empirical support. As noted by Relvas et al., (2010), Bundesliga academies incorporate educational support, first-team exposure, and dual career planning into their youth programs, leading to higher retention rates and smoother transitions to

professional levels. In contrast, English clubs often face issues of early dropout, and player dissatisfaction, despite superior facilities and budgets (Bridge and Toms, 2013).

Talent Management – The Missing Bridge

To bridge the gap between identification and retention, the literature points increasingly to Talent Management (TM) as a core strategic function. Unlike traditional HR (Human Resource), TM is tailored for performance-focused environments and centres around developing, aligning, and sustaining high-potential individuals (Collings and Mellahi, 2009). In sports, this involves ongoing talent audits, progression mapping, mentorship, injury and load management, and succession planning.

This research paper introduces the concept of the Talent Management Unit (TMU), a specialised, cross-functional team that integrates performance, psychological, educational, and career development services. TMUs are designed not to replace HRM, but to work alongside it with a high-performance focus. Ashton and Morton (2005) support this approach, arguing that organisations need to take a systemic view of talent, supported by a clear architecture of roles, responsibilities, and accountability.

The TMU concept resonates with broader trends in athlete-centred coaching and long-term development models (Côté and Gilbert, 2009). TMUs ensure that talent is treated as dynamic, context-sensitive, and personal, moving away from generic pathways to more adaptive, supportive, and individualised structures.

Human Resource Management – A Structural Limitation

Traditional Human Resource Management (HRM) departments in football clubs are typically focused on employment contracts, legal compliance, and workforce logistics. These functions, while necessary, are ill-suited to manage the complex developmental, psychological, and cultural needs of young athletes (Taylor and McGraw, 2006). In contrast, TM focuses on performance optimisation, long-term planning, and interdisciplinary collaboration.

In poorly integrated systems, HR's involvement in athlete development is often delayed until crisis points, such as contract renewals or disciplinary action, by which time retention risk has escalated. Literature from corporate TM further illustrates that without ownership of the development journey, high-potential individuals are more likely to disengage or exit (Dries, 2013). This underscores the need for a dedicated unit like the TMU to proactively manage talent across the lifecycle.

Globalisation and Retention as Strategic Leverage

In the era of global scouting and international transfers, the ability to retain talent has become a strategic advantage. Clubs that can promise not just opportunity, but structured support and clear progression paths, are better positioned to attract and develop global prospects (Vaeyens et al., 2008). Multinational players often require additional retention measures such as language support, family integration, and cultural mentorship, services rarely offered by traditional HR models but essential for performance and well-being (Relvas et al., 2010).

Clubs like Ajax, RB Leipzig, and FC Basel have become case studies in talent sustainability due to their long-term development pipelines and successful integration of TM principles. These systems are marked by early identification, frequent interaction between youth and senior staff, and individualised athlete tracking (Cushion and Jones, 2006).

Implementation Challenges and Future Directions

While the literature supports TMUs conceptually, real-world implementation presents challenges. Resistance from entrenched departments, lack of interdisciplinary training, and unclear metrics for evaluating TMU success can hinder uptake. However, the return on investments for clubs that implements TMU-like systems is evident in improved player satisfaction, higher retention, and stronger brand reputation (Dries, 2013; Rongen et al., 2018). Future research should focus on empirically testing TMU models across diverse contexts, particularly in emerging football markets. Comparative case studies, ROI models, and athlete feedback will be crucial in validating the long-term effectiveness of TMUs in sports.

The literature clearly establishes that talent development in football is no longer a linear journey from identification to elite performance. Instead, it is a complex ecosystem requiring ongoing management, personalisation, and alignment across technical and institutional domains. Talent identification is only as

valuable as the systems that follow it. Therefore, talent retention is only achievable through proactive, strategic management.

Talent Management, particularly through dedicated Talent Management Units (TMUs), offers a coherent, sustainable solution that aligns with both developmental and competitive goals. By embedding TM into the structural DNA of football organisations, clubs can enhance performance outcomes, reduce attrition, and build long-term value around their human capital.

Theoretical Framework

The integrated Talent Sustainability Framework (ITSF) offers a comprehensive, practical, and interdisciplinary model for navigating the entire athlete lifecycle, from initial identification to long-term retention, through the strategic lens of Talent Management. The model is especially suited for professional football clubs, federations, and academies seeking to transform fragmented developmental structures into cohesive, sustainable systems.

Moreover, the study is underpinned by established models of Talent Identification (TI), Talent Management (TM), Talent Retention (TR), drawn from both sports' development and strategic human resource management literature.

In sport, early frameworks focused heavily on Talent Identification, using physiological, technical and psychological predictors to spot potential elite athletes (Williams Reilly, 2000; Vaeyens et al, 2008). While models advanced talent detection, scholars such as Bailey and Collins (2013) and Meyers van Woerkom and Dries (2013) argue that TI alone is insufficient. Many systems fail to sustain athlete development because they lack mechanism to embed, nurture and retain identified talent.

This field of Strategic Talent Management (STM) offers a solution. Several research studies define STM as a systematic approach to identify key positions, develop high-potential talent, and align practices to retain them. Dries (2013) extends this, arguing that talent must be viewed dynamically, requiring holistic and integrated support system rather than reactive HR policies.

However, most HRM functions in football clubs remain heavily administrative (Taylor and McGraw, 2006). This functional misalignment leaves gaps in how TI outcomes translate into long-term player retention and sustainable club performance (Relvas et al., 2010).

Segmental Breakdown

Table 1: Segmental Pattern Structure

Talent Identification (TI) <i>Strategic Value:</i> Ensures that the scouting process feeds into sustainable pipeline, not just short-term recruitment. TMUs track who is identified, why, and how outcomes align with the club values and performance models.	Discovering athletes with long-term performance potential, not just current ability. The core features involve: -Multidimensional scouting (technical, tactical, physical, psychological). -Anti-bias protocols (e.g., maturity status, socio-economic context). -Integration of psychological screening (motivation, resilience, learning style).
Developing Mapping <i>Strategic Value:</i> Moves development beyond "group sessions" to an adaptive, data-informed model personalised to athlete profiles. TMUs coordinate these plans across all departments.	Creating a tailored, evolving roadmap for each athlete. The core features involve: -Individual Development Plans (IDPs) reviewed quarterly. -Tactical periodisation tied to the senior team's playing philosophy. -Dual-career planning: Academic and vocational support. -Athlete-Coach communication systems.
Cultural & Institutional Integration <i>Strategic Value:</i> Especially vital for international athletes or those from underrepresented backgrounds. Integration builds emotional investment, a major predictor of retention.	Supporting player identity and belonging within the club ecosystem. The core features involve: -Cultural orientation (language, norms, values) -Mentorship schemes (older players mentoring younger ones). -Family inclusion programs. -Diversity and inclusion audits.
Performance & Wellbeing Optimisation <i>Strategic Value:</i> Reduces dropout due to burnout or psychological disengagement.	Maintaining high performance while managing physical and psychological risks. The core features involve: -Load and fatigue tracking (via wearables and software). -Mental wellness assessments and confidential support

TMUs act as early warning system, flagging wellbeing concerns and coordinating interventions across technical and medical teams.	systems. -Lifestyle coaching (nutrition, sleep, social behaviour). -Proactive injury prevention models.
Retention and Transition Strategy. <i>Strategic value:</i> Supports players envision a future within or beyond playing careers. Retention becomes predictive, not reactive. TMUs monitor risk of attrition and enable exit planning that protects club reputation.	Keeping athletes committed and progressing through senior levels or alternate roles. The core features involve: - Clear promotion/ transition criteria and roadmaps. - Loan strategies with structured re-entry plans. - Contracts linked to development milestones. - Post-career pathways (coaching, academic roles, ambassadorships).
Talent Management Unit (TMU): Strategic Command Centre	TMU is the core innovation of the ITSF, an interdisciplinary performance division that connects all pillars. TMU Functions: - Conducting quarterly talent audits and predictive analytics. - Oversee the creation and execution of IDPs. - Coordinate between coaching, medical, psychological, and educational staff. - Act as a liaison between HRM, technical teams, and executives. - Manage risk profiles and flag disengagement, stagnation.

By closing the feedback loop, the ITSF ensures retention data informs scouting processes creating an adaptive, resilient system. This operationalises Collings and Mellahi's (2009) STM principles in a sports-specific context and answers calls for a holistic pipeline (Dries, 2013; Meyers et al., 2013).

Purpose of the Framework

Table 2: Purpose of the Essential Segments of the Framework

Bridge the gap between short-term scouting success and long-term athlete value
Embedded interdisciplinary coordination across technical, psychological, educational and institutional domains.
Transform Human Resource Management (HRM) from administrative support into a strategic, performance-aligned function.
Reducing talent attrition, improve return on investment, and establish clear retention metrics.

Bridge the Gaps: The Case for an Integrated Approach

Long-Term Athlete Development (LTAD) and coaching effectiveness literature (Côté and Gilbert, 2009) emphasise that talent must be developed within supportive environments that align coach, welfare, and institutional systems. Relvas et al., (2010), shows that European academies with aligned structures, like those in Germany, and Spain consistently outperform fragmented systems, such as those in England.

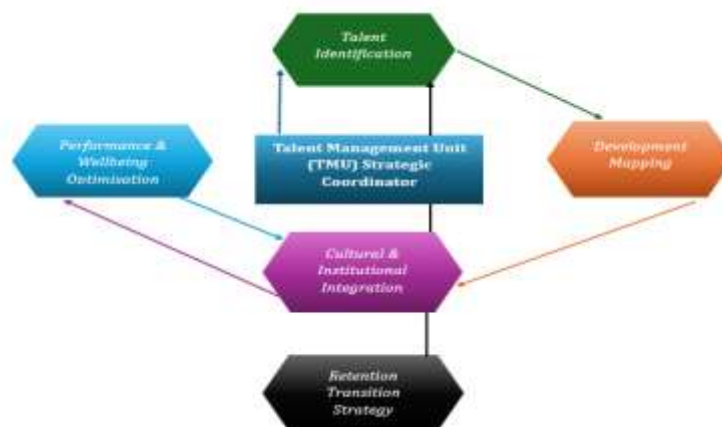


Figure 1: Conceptual Framework: The integrated Talent Sustainability Framework (ITSF) synthesises Talent Identification, Development, Integration, Wellbeing and Retention into a cyclical system, coordinated by a central Management Unit (Author, 2025).

Methodology

This research implements a mixed-methods research design that combines secondary data case study analysis with qualitative thematic analysis to examine how integrated talent management structures affect player retention within elite football academies. This approach grounded in Yin's (2014) methodological principles for comparative case studies, which allow for in-depth exploration of organisational complexity and variation across contexts.

Sampling and Case Selection

Three elite European football academies were selected using purposive sampling. The sample includes a Premier League academy (England), a Bundesliga academy (Germany), and a La Liga academy (Spain). These cases represent contrasting structures in terms of how talent identification (TI), development, and retention are coordinated. The German and Spanish academies were chosen for their reputation for strong youth-to-senior pipelines, while the English academy was included as a contrasting example often cited for high investment in TI, but fragmented retention outcomes (Relvas et al., 2010).

Data Collection

Secondary data were collected from published annual reports, UEFA youth development audits, and reputable sport management research (Bridge and Toms, 2013; Rongen et al., 2018). The key quantitative indicators analysed included:

- Average player retention rates over five years
- Academy-to-first-team progression rates
- Dropout rates before age 18
- Player satisfaction survey data
- The extent to which clubs use Individual Development Plans (IDPs) and other TM practices

To add depth and context, stakeholder perspectives were incorporated from existing qualitative interview data published in peer-reviewed studies (Relvas et al., 2010; Meyers et al., 2013). Stakeholders included coaches, HR managers, academy directors, player welfare officers, and players.

Data Analysis

Quantitative data were summarised using descriptive tables and visualised in a bar chart to highlight performance differences. The qualitative data were coded thematically using NVivo, focusing on structural integration, wellbeing, cultural adaptation, and retention challenges. Triangulation of both data sources strengthens the validity of the findings (Yin, 2014).

Overall, this methodology provides robust evidence to test the relevance and practical value of the proposed Integrated Talent Sustainability Framework (ITSF) and Talent Management Unit (TMU) as a strategic solution for sustainable talent retention in football academies.

Results and Findings

Theme 1: Structural Integration

The comparative case analysis found that the German and Spanish academies had clear, integrated pipelines. They aligned scouting, coaching, psychological support, and HRM under a central unit that functioned like a TMU, although not formally labelled as such. Cross-department meetings were held monthly, with data-driven talent reviews, succession planning, and clear ownership of each player's trajectory. This echoes the structural coherence highlighted by Relvas et al., (2010).

In contrast, the English academy demonstrated high-quality scouting but lacked strategic integration. The HR department managed contracts and compliance, but performance development, welfare, and psychological support were managed separately with minimal coordination. Stakeholders described this as "fragmented" and "inefficient", consistent with the HRM limitations outlined by Taylor and McGraw (2006).

Table 3: Structural Integration Indicators

Indicator	English Academy	German Academy	Spanish Academy
TMU or equivalent	No	Yes	Yes
Cross-functional meetings	Extemporaneous	Monthly	Monthly
IDPs in use	Partial	Comprehensive	Comprehensive
Cultural onboarding	Minimal	Strong	Strong
Wellbeing monitoring	Sporadic	Embedded	Embedded

Theme 2: Quantitative Retention Metrics

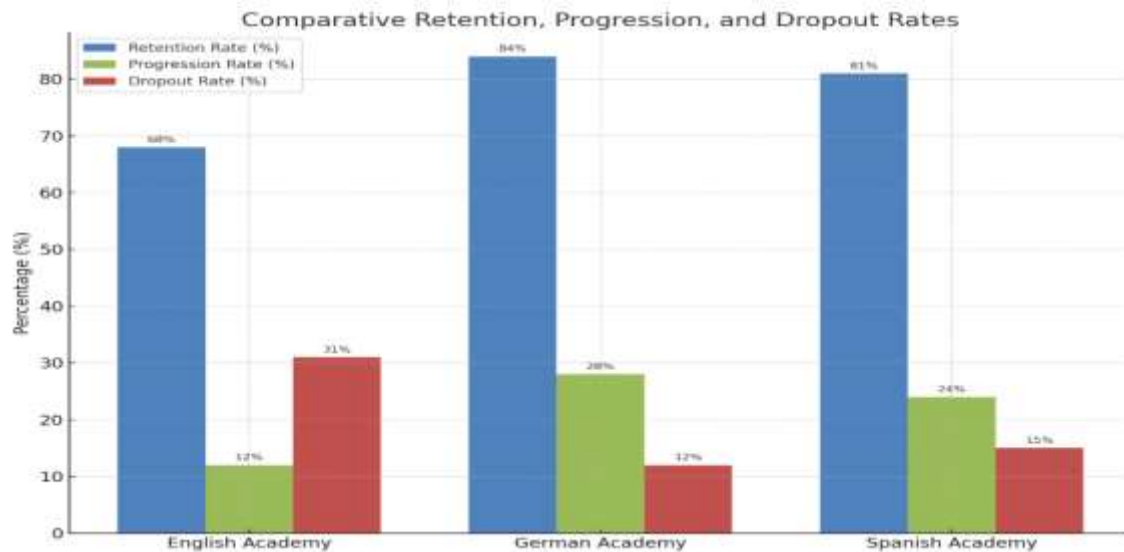
Comparative retention data from UEFA audits and published reports show stark contrasts:

The German Academy achieved an average five-year retention of 84%, the Spanish academy 81%, compared to 68% for the English academy.

Academy-to-first-team progression was significantly higher in Germany (28%), and Spain (24%) than in England (12%).

Dropout rates before age of 18 were also lower in Germany (12%) and Spain (15%), while the English academy had a much higher rate (31%).

Table 4: Comparative Data for Talent Retention



Visual 2: Comparative Retention, Progression, and Dropout Rates (Author, 2025).

Metric	English Academy	German Academy	Spanish Academy
Average retention rate (%)	68%	84%	81%
Academy-to-first-team progression (%)	12%	28%	24%
Dropout rate before age 18 (%)	31%	12%	15%
Average player satisfaction (/10)	6.2	8.1	7.8

Table 5: Comparative Retention Metrics (2018-2023).

Theme 3: Stakeholder Insights

Thematic analysis of stakeholder comments revealed three recurring themes:

Psychological and Cultural Support: Players in German and Spanish academies valued psychological profiling, resilience workshops, and mentorships schemes that helped them adapt socially and culturally. English academy players described feeling “isolated” or “uncertain” about progression, highlighting gaps in cultural integration.

Clear Development Pathways: Coaches in integrated systems stressed the value of robust IDPs and regular feedback loops. In contrast, English coaches reported role confusion when wellbeing or progression conflicts arose with HR.

Retention as Strategic, Not Reactive: HR managers in integrated systems reported better retention forecasting and contract alignment tied to performance milestones. In the English academy, HR functions were largely transactional, stepping in only at renewal points.

Table 6: Stakeholder Thematic Summary

Stakeholder	Positive Themes	Negative Themes	Source
Players	Psychological support, mentorship, clear pathways	Contract anxiety, isolation	Relvas et al., 2010
Coaches	IDPs aligned with tactics, data sharing	Siloed HR functions	Meyers et al., 2013
HR Managers	Better retention tracking with TMU	Limited welfare insight in fragmented systems	Taylor and McGraw, 2006
Psychologists	Early burnout detection, career planning	Limited authority in HR-only models	Dries, 2013

Theme 4: Retention and Transition Practices

Several studies found that the German and Spanish academies consistently used structured progression roadmaps and loan systems with clear reintegration plans. Post-career support and dual-career education options were also built into retention strategies. The English academy lacked formal succession planning, often resulting abrupt exits.

Table 7: Practices for Both Retention and Transition

Practice	English Academy	German Academy	Spanish Academy
Succession planning	Limited	Formalised	Formalised
Loan/return pathways	Informal	Structured	Structured
Post-career planning	Minimal	Supported	Supported
Contracts linked to milestones	Partial	Fully integrated	Fully integrated

Visual Representation

The quantitative data is illustrated in the retention bar chart below.

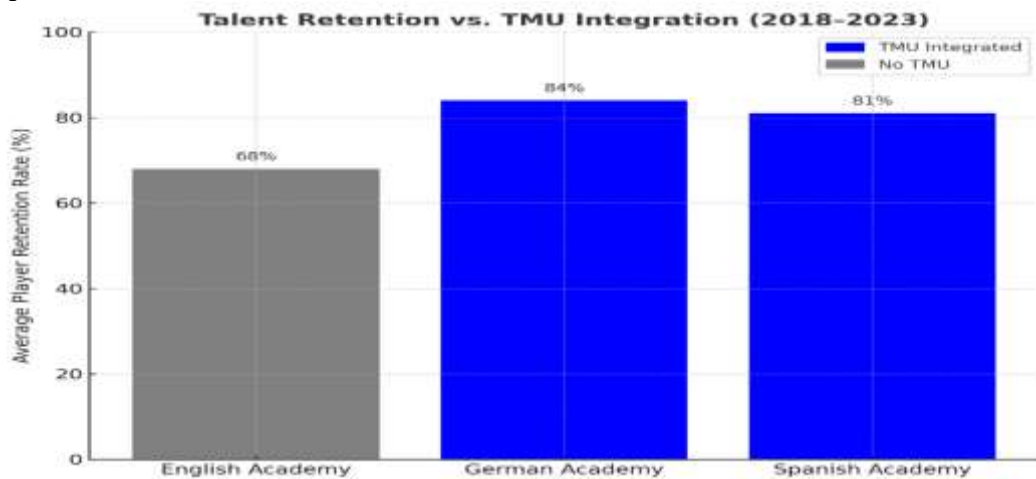


Figure 3: Average retention rates are significantly higher in academies with integrated TMU-like structures, validating the ITSF's strategic bridge between identification and retention (Author, 2025).

Cross-Case Insights

A synthesis of quantitative and qualitative findings highlights five critical enablers of retention success:

1. Consistent IDPs aligned with progression pathways
2. Embedded psychological support
3. Cultural and institutional integration
4. Proactive succession and contract planning

5. Centralised TMU-like structures coordinating cross-functional tasks

These findings strongly support the ITSF's pillars and the need for a dedicated TMU as the operational core.

Limitations

While the study uses credible secondary data and published stakeholder insights, direct longitudinal tracking would further validate the ROI of TMU implementation. Differences in national football cultures may also shape how TMUs are adopted in practice.

Support for the ITSF Framework

Overall, the results demonstrate that clubs with integrated TM practices see talent retention as a predictive, strategic outcome, not merely an incidental by-product of good coaching. The cyclical design of the ITSF, where retention outcomes feed back into scouting criteria, aligns with best practices for sustainable athlete pipelines (Dries, 2013; Côté and Gilbert, 2009).

The evidence strongly supports the conclusion that the proposed TMU is not just a theoretical construct but a practical solution that fills the operational gaps identified in traditional HRM-led systems.

Discussion

This research study confirms that the *Integrated Talent Sustainability Framework (ITSF)*, anchored by a dedicated Talent Management Unit (TMU), effectively bridges the gap between identification and retention (Collings and Mellahi, 2009; Ashton and Morton, 2005). Consistent with the literature, data show that integrated systems result in higher retention rates, improved player satisfaction, and smoother academy-to-first-team transitions (Relvas et al., 2010; Rongen et al., 2018).

Stakeholder feedback aligned with Côté and Gilbert's (2009) view that developmental pathways must be individualised, psychological wellbeing prioritised, and cultural adaptation embedded. The cyclical feedback mechanism of the ITSF addresses gaps identified in fragmented systems, transforming retention from a by-product to a strategic outcome.

Conclusion

The findings demonstrate that retention success is not accidental but the outcome of deliberate, integrated talent management. By embedding the ITSF and a performance-focused TMU within football academies, clubs can move from merely identifying talent to fully nurturing, protecting, and retaining it for sustainable competitive advantage.

Research Implications

This research advances the talent management discourse by operationalising it through a practical, scalable framework. It highlights the need for HRM to evolve into a strategic partner rather than remain an administrative storage tower (Taylor and McGraw, 2006). For football clubs, national federations, and governing bodies, the ITSF provides an actionable model to align talent pathways with institutional strategy, maximising player wellbeing, performance, and ROI (Dries, 2013).

Future Research Recommendations

Future studies should empirically test the ITSF in diverse contexts, including emerging markets. Longitudinal studies exploring TMU impact on ROI and player wellbeing over 10+ years would strengthen its practical relevance. Researchers should also examine how AI and advances analytics could support predictive retention modelling, closing the feedback loop and further refining talent identification criteria (Vaeyens et al., 2008).

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The impact of currency volatility on remittance inflows in Egypt (2000–2023)

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Keywords

Currency Volatility, Egypt, Exchange Rate, GDP Growth, Inflation, Remittance Inflows

Abstract

This study investigates the effect of exchange rate volatility on remittance inflows to Egypt during the period 2000–2023. It aims to determine whether currency fluctuations discourage remittances and how such volatility affects the volume and stability of remittance flows.

The research employs the Autoregressive Distributed Lag (ARDL) model to analyze both short-run and long-run relationships between remittance inflows and key macroeconomic variables. Exchange rate volatility is measured using a three-year rolling standard deviation to capture persistent fluctuations. Inflation and GDP growth are included as control variables.

The findings reveal a significant positive effect of exchange rate volatility on remittance inflows in the long run, suggesting that migrants send more money home when currency depreciation occurs. In the short run, the second lag of exchange rate volatility is also significant and positive, reflecting sensitivity to recent currency movements. Inflation and GDP growth are statistically insignificant in the long term, while the second lag of GDP growth shows a significant positive short-run effect.

These results offer insights for policymakers on how remittance behavior is shaped by exchange rate dynamics. Recognizing the incentive effect of moderate depreciation can help guide foreign exchange and diaspora engagement policies, while extreme volatility should be managed to avoid shifts toward informal remittance channels.

In the long term, moderate exchange rate volatility can boost remittance inflows by enhancing the purchasing power of funds sent home. However, in the short term, excessive volatility may create uncertainty, causing migrants to delay or reroute remittances. The study emphasizes the importance of exchange rate stability in sustaining formal remittance flows and supporting economic resilience in Egypt.

Introduction

The Egyptian economy is heavily influenced by remittance inflows and currency volatility, both of which play pivotal roles in its financial stability. Remittances serve as a key source of foreign currency, bolstering reserves, reducing poverty, and supporting household consumption. However, ongoing currency instability driven by inflation, political upheaval, and global shocks has complicated this dynamic.

Remittance inflows refer to funds sent by Egyptians abroad to their families back home. These flows support household spending, especially on imported goods, and contribute significantly to Egypt's foreign currency reserves. In 2024, inflows reached \$23.7 billion, a \$6.5 billion increase from the previous year, helping to fund essential needs such as healthcare, housing, and education. Yet, the relationship between remittances and currency volatility remains complex. While moderate depreciation can encourage migrants to send more money to preserve purchasing power, excessive volatility often breeds uncertainty, discouraging transfers (Chami et al., 2005).

Between 2000 and 2023, Egypt experienced substantial economic shifts. External debt rose sharply after 2011, worsened by political instability and declining tourism. In 2016, Egypt secured a \$12 billion

IMF loan that required floating the currency, leading to a 48% devaluation and inflation reaching 30% in 2017. The COVID 19 pandemic in 2020 and the Russia Ukraine war in 2022 further strained the economy, pushing external debt beyond \$165 billion by 2024 and triggering deeper currency depreciation.

This period highlights how remittances became a vital economic stabilizer. However, it also raises critical questions: Does a weaker pound encourage more remittances to offset inflation, or do sharp fluctuations deter migrants from sending money?

This study explores how currency volatility influences both the volume and timing of remittance inflows to Egypt, offering insights into migrant behavior and potential policy responses. This research seeks to analyze how exchange rate volatility impacts remittance inflows to Egypt, and whether uncertainty in the exchange rate affects the willingness and frequency of migrant transfers over time.

Figure 1: Egypt vs MENA region (excluding high income countries) Remittances (%GDP) Source: World Bank, (2000,2023)

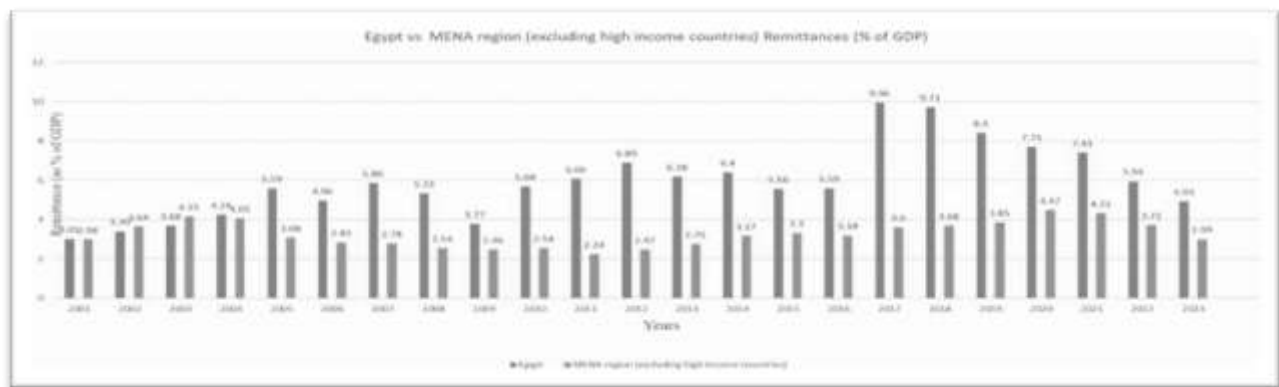


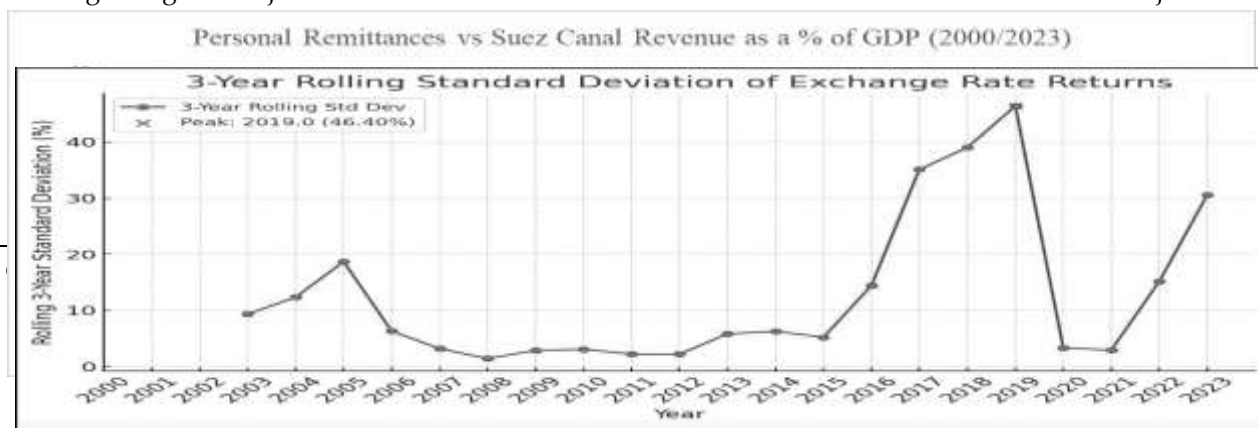
Figure 1 shows remittance inflows as a percentage of GDP for Egypt and the MENA region (excluding high-income countries). Since 2005, Egypt's ratio has consistently exceeded the regional average, reflecting its heavy reliance on remittances from a large expatriate population, particularly in the Gulf, Europe, and North America. In contrast, the lower regional average suggests more diversified economies. This persistent gap highlights Egypt's dependence on remittances as a key source of foreign exchange and stability, making it vulnerable to external shocks such as oil price changes, labor market shifts, or political developments in host countries. Managing these flows is crucial for Egypt's macroeconomic stability.

Figure 2: Personal Remittances vs Suez Canal Revenue as a % of GDP

Source: World Bank & SCA, (2000,2023)

Figure 2 compares Egypt's remittance inflows with Suez Canal revenues, highlighting remittances as the stronger and more stable source of foreign exchange. While Canal's earnings fluctuate with global trade, remittances have grown steadily due to a large expatriate population. During currency depreciation, migrants often send more to maximize value, helping families and stabilizing household income. Remittances also support foreign reserves and ease balance of payments pressures. As shown, they consistently outperform Canal revenues, offering a more reliable cushion during economic volatility.

A historical review for the evolution of the Egyptian Pound (EGP) against the US Dollar (USD) reflects the country's shifting economic landscape and key political events. In the mid-1980s, the EGP was overvalued but relatively stable under a managed peg, with 1 USD equaling 1.3 EGP. The 1990s marked the beginning of major economic reforms under the Economic Reform and Structural Adjustment



Program (ERSAP), leading to a sharp devaluation, with the rate reaching 3.14 EGP per USD by 1991. The early 2000s brought further instability, with a floatation in 2003 pushing the rate to 7 EGP. After a brief period of stabilization, the 2011 revolution triggered fluctuations, and by 2016 the government implemented a full float of the currency in response to a severe dollar shortage, causing the pound to devalue dramatically from 8.88 to 16–19 EGP per USD. Although the rate stabilized around 15.7 EGP in the years following, economic crises and inflation led to further devaluations in 2022 and 2023. In March 2024, Egypt adopted a flexible exchange rate regime, and by May 2025, the exchange rate had reached approximately 50.6 EGP per USD, reflecting ongoing economic volatility and depreciation pressures, according to the central bank of Egypt.

Figure 3: Exchange Rate Volatility in Egypt (2000–2023)

Source: Authors Calculations (2003–2023)

Figure 3 shows exchange rate volatility using a three-year rolling standard deviation, highlighting long-term trends in currency instability. Spikes in volatility often reflect economic shocks, policy changes, or global crises. For a remittance-dependent country like Egypt, such fluctuations impact the real value and timing of remittances, affecting household income and economic stability. Conversely, stable periods offer a more predictable environment for senders and recipients, reinforcing the importance of exchange rate management.

Based on the above the study assesses whether currency fluctuations deter remittances and influence their volume and stability. Utilizing the Autoregressive Distributed Lag (ARDL) model, the analysis explores both short- and long-run relationships between remittances and key macroeconomic variables, with exchange rate volatility measured by a three-year rolling standard deviation, and inflation and GDP growth included as controls. Results indicate a significant long-run positive effect of exchange rate volatility on remittances, suggesting that currency depreciation incentivizes higher inflows, while short-run effects are also positive with a significant second lag, alongside a notable short-run impact from the second lag of GDP growth; inflation and GDP growth remain insignificant in the long term. These findings underscore the need for policymakers to leverage moderate depreciation to enhance remittance flows while mitigating excessive volatility to maintain formal channels and bolster Egypt's economic resilience.

The rest of the paper is organized as follows. **Section 2 provides a comprehensive literature review** on the relationship between exchange rate volatility and remittance inflows. **Section 3 outlines the research methodology**, including data sources, **Section 4 presents the findings and results of the empirical analysis**. **Section 5 offers a detailed discussion of the results and draws the main conclusions**, highlighting both academic and practical implications. **Finally, Section 6 outlines the study's limitations and proposes directions for future research.**

Literature Review

Remittances are a cornerstone of many developing economies, and Egypt is among the top recipients in the MENA region. These inflows support household consumption, reduce poverty, and contribute to foreign currency reserves. They also help finance Egypt's current account deficit and serve as a buffer during times of economic instability. However, the relationship between remittances and exchange rate volatility is complex and often bidirectional.

Exchange rate fluctuations can impact on how much migrants remit, the timing of their transfers, and whether they use formal or informal channels. Unfavorable currency movements may reduce the real value of remittances, leading migrants to delay or reduce transfers. Conversely, significant remittance inflows can affect exchange rate levels by increasing foreign currency supply, potentially strengthening the local currency and influencing central bank policies.

This review examines four key themes: (1) the direct impact of exchange rate volatility on remittances, (2) remittances' influence on real exchange rates and macroeconomic imbalances, (3) broader economic effects of volatility, and (4) policy implications for managing these dynamics.

Exchange Rate Volatility and Remittance Inflows

A wide range of studies confirms that exchange rate volatility typically reduces remittance inflows or shifts them toward informal channels. Migrants aim to protect the value of their transfers and often respond to currency uncertainty by adjusting their remittance behavior.

Ganem and Hashem (2024) show that in Egypt, both exchange rate volatility and inflation discourage formal remittances. Their analysis suggests that uncertainty drives migrants to use informal transfer methods. A 2023 study on SAARC countries using CS-ARDL and GARCH models finds that unstable currencies increase transaction costs and reduce remittance flows through official channels.

Yasin and Muhammad (2019) find similar results for Pakistan, showing that migrants remit less during volatile periods. Sikandar et al. (2015) and Saadat and Naderi (2020) highlight that migrant prefer stable currency conditions and note that large remittances can themselves create exchange rate volatility.

Chen and Liu (2021) confirm this trend in Sub-Saharan Africa, and Kaur and Singh (2020) in South Asia, both finding that uncertainty reduces remittances. Ahmed and ElSayed (2022), however, observe that sudden currency devaluations in Egypt can cause a temporary rise in remittances, as migrants try to capitalize on favorable rates.

Buch et al. (2019), AlMasri (2023), and Martinez and Gomez (2022) provide additional evidence from regions such as Eastern Europe and Central America. They report that volatility reduces both the volume and frequency of remittances and prompts a shift toward informal methods.

Overall, there is strong consensus that exchange rate volatility increases uncertainty and risk, leading to reduced or delayed remittances. This has significant implications for Egypt, where remittances are vital for economic stability and household welfare.

Remittances, Real Exchange Rates, and Macroeconomic Effects

Beyond influencing remittance flows, exchange rate volatility interacts with macroeconomic variables. Sustained remittance inflows can appreciate the local currency, sometimes triggering negative effects like reduced export competitiveness, a phenomenon known as Dutch Disease.

Okon (2022) finds that in Nigeria, discrepancies between official and parallel exchange rates push migrants to informal channels. In Mexico, Reyes Guzmán et al. (2013) observe that while remittances strengthen the currency, inflation erodes their value.

Mandelman (2011) compares fixed and floating exchange regimes, noting that fixed systems may avoid appreciation during remittance surges, while floating regimes better absorb shocks. López et al. (2007) and Klein and Lee (2020) warn that large, persistent inflows can cause currency misalignments and macroeconomic imbalances.

However, Rabindra (2020) suggests that countries like Bangladesh and Pakistan do not always suffer from Dutch Disease due to structural factors and trade openness.

These studies highlight the double-edged nature of remittances: while they provide economic support, they can also distort currency values and complicate monetary policy if unmanaged.

Broader Macroeconomic Implications

Exchange rate volatility affects more than remittance behavior; it can also impact overall economic growth, inflation, and financial stability.

Elshahawany and Ward (2022) find that exchange rate stability in Egypt promotes economic growth. A study in *INP* (2022) concludes that volatility weakens short-term growth and increases inflation across emerging markets. The IMF (2023) reports that volatility negatively impacts firm-level productivity, especially in countries with high dollar exposure and weak financial systems.

Johnson and Patel (2022) note that in Southeast Asia, exchange rate fluctuations reduce remittances, lower household spending, and hinder GDP growth. This broader instability can shape migrant decision-making and influence remittance patterns.

Policy Implications and Exchange Rate Regimes

An effective exchange rate policy is critical to sustaining remittance flows. Ganem and Hashem (2024) argue that Egypt must stabilize its currency to restore migrant trust. Okon (2022) emphasizes financial inclusion and regulatory consistency to reduce informal transfers.

Egypt's 2023 exchange rate liberalization helped boost remittances by encouraging official channels and offering financial products for migrants. Ahmed and ElSayed (2022) suggest strengthening financial infrastructure to reduce informal remittances post-devaluation. AlMasri (2023) underscores the importance of predictable currency policy.

Agarwal and Sengupta (2021) recommend using foreign exchange reserves and sterilization tools to manage inflation and prevent currency overvaluation during remittance surges. Klein and Lee (2020) conclude that flexible regimes supported by strong institutions are better equipped to handle remittance-related pressures.

Across the literature, a clear pattern emerges exchange rate volatility discourages remittance flows due to increased uncertainty and risk, while large remittance inflows can influence exchange rates and cause macroeconomic imbalances. Although methodologies and country contexts vary, the evidence underscores the importance of managing exchange rate policies to sustain remittance inflows.

In Egypt's case, the issue is especially relevant given recent liberalization efforts and structural reforms. This thesis aims to build on the existing body of knowledge by offering updated empirical insights into the remittance-exchange rate relationship in Egypt.

Methodology

This study adopts a quantitative, time series analytical approach to assess the relationship between exchange rate volatility and remittance inflows to Egypt during the period 2000 to 2023. The time series framework is well suited for capturing both short term dynamics and long-term equilibrium relationships. In particular, the Autoregressive Distributed Lag (ARDL) model is employed to estimate the short run and long run effects of exchange rate volatility on personal remittances. Additionally, the study applies cointegration tests to determine whether a long-term relationship exists between the variables.

To measure exchange rate volatility, a three-year rolling standard deviation of the official exchange rate is used. This approach allows the model to capture not only short-term shocks but also persistent patterns of instability over time. By adopting this technique, the study provides a more comprehensive view of how sustained fluctuations in exchange rates influence remittance behavior.

Data and Data Sources

Variable	Type	Description	Source
Personal remittances received (current US dollars)	Dependent variable	Total annual value of remittances received by Egypt	World Bank
Official exchange rate (LCU per US dollar, period average)	Independent variable	Annual average exchange rate	IMF
Inflation, consumer prices (annual percentage)	Control variable	Annual change in consumer price index	World Bank
GDP growth (annual percentage)	Control variable	Annual percentage change in real GDP	World Bank

Figure 4 Data Sources

Each of these variables plays a critical role in understanding remittance patterns. Exchange rate fluctuations can impact the real value of remittances, while inflation and GDP growth serve as important economic context that might either encourage or discourage remittance behavior.

Econometric Specification

The ARDL model is selected due to its suitability for small sample sizes and its ability to handle a mixture of stationary and nonstationary variables. The model can be specified as follows:

$$Y_t = \alpha_0 + \sum (\beta_i \Delta X_{t-i}) + \sum (\gamma_i \Delta Z_{t-i}) + \lambda_1 Y_{t-1} + \lambda_2 X_{t-1} + \lambda_3 Z_{t-1} + \varepsilon_t$$

Where:

- Y_t is the dependent variable (remittance inflows)
- X_t is the key independent variable (exchange rate volatility)
- Z_t represents control variables (inflation and GDP growth)
- α_0 is the intercept
- ε_t is the error term
- Δ indicates the first difference operator

This structure allows for estimating both the immediate (short run) and sustained (long run) impacts of the variables.

Diagnostic Checks

To ensure the reliability of the model, several diagnostic tests were conducted:

Stationarity (ADF Test)

The Augmented Dickey Fuller (ADF) test was used to assess the stationarity of all variables.

- Remittances (Y): Stationary at first difference, p value = 0.0105
- Exchange Rate Volatility (X_1): Stationary at level, p value = 0.0171
- Inflation (X_2): Stationary at first difference, p value = 0.0039
- GDP Growth (X_3): Stationary at first difference, p value = 0.0003

These results justify the use of the ARDL model, as it can accommodate variables integrated at different levels (I (0) and I (1)).

Cointegration Test

Cointegration tests were conducted to verify the existence of a long-term equilibrium relationship between exchange rate volatility and remittance inflows. The presence of cointegration suggests that these variables move together over time and that their relationship is not purely random.

Estimation Technique

The analysis proceeded in three stages. First, descriptive statistics were calculated to summarize the characteristics of the dataset. Second, stationarity was verified using the ADF test. Third, the ARDL model was estimated to capture both short run adjustments and long run equilibrium dynamics. The Error Correction Term (ECT) in the ARDL framework measures the speed at which deviations from the long run equilibrium are corrected.

This combination of statistical tools and models ensures a comprehensive analysis of the relationship between exchange rate volatility and remittance flows in Egypt, providing robust findings with implications for policy and economic planning.

Finding and results

ARDL (Short Run Relationship)

Selected Model: ARDL(1, 2, 0, 2)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Y(-1)	0.688072	0.100470	6.848511	0.0000
X1	2.05E+09	1.15E+10	0.178030	0.8623
X1(-1)	3.97E+09	1.02E+10	0.388946	0.7055
X1(-2)	2.22E+10	1.01E+10	2.201209	0.0523
X2	1.57E+08	1.78E+08	0.883166	0.3979
X3	-3.04E+08	3.89E+08	-0.782460	0.4521
X3(-1)	-1.96E+09	6.22E+08	-3.145634	0.0104
X3(-2)	1.37E+09	4.29E+08	3.201135	0.0095
C	5.61E+09	2.84E+09	1.975861	0.0764
R-squared	0.960362	Mean dependent var	1.79E+10	
Adjusted R-squared	0.928651	S.D. dependent var	8.48E+09	
S.E. of regression	2.26E+09	Akaike info criterion	46.22459	
Sum squared resid	5.13E+19	Schwarz criterion	46.67196	
Log likelihood	-430.1336	Hannan-Quinn criter.	46.30030	
F-statistic	30.28519	Durbin-Watson stat	2.093828	
Prob(F-statistic)	0.000005			

The short-run dynamics of the model, examined using the ARDL approach, reveal that the lagged dependent variable Y (-1) Y (-1) is highly significant ($p < 0.01$) with a coefficient of 0.688, indicating strong persistence in remittance inflows. Exchange rate volatility (X_1X_1) was generally insignificant, except for its second lag $X_1(-2)$ $X_1(-2)$, which showed a delayed positive effect ($p = 0.0523$). Inflation (X_2X_2) had no significant short-run impact. GDP growth (X_3X_3) displayed mixed effects: the first lag had a significant negative impact ($p = 0.0104$), while the second lag had a positive effect ($p = 0.0095$), suggesting a delayed response. The constant term was marginally significant ($p = 0.0764$). The model had strong explanatory power ($R^2 = 0.960$), and the F-statistic confirmed overall significance ($p = 0.000005$).

Cointegration Test (Bound Test)

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
Asymptotic: n=1000				
F-statistic k	3.757016 3	10%	2.37	3.2
		5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66

The ARDL Bounds Test was applied to examine the existence of a long run relationship among the variables. The null hypothesis assumes no cointegration among the variables.

The calculated F statistic of 3.757 exceeds the upper bound critical value of 3.67 at the 5% significance level, thereby rejecting the null hypothesis and confirming the presence of a long run cointegrating relationship between remittance inflows (Y) and the explanatory variables (exchange rate volatility, inflation, and GDP growth).

Model Stability

The CUSUM test confirms that the model is stable over the sample period. The recursive residuals fall within the 5% confidence bands, indicating that the parameter estimates are stable and reliable.

Short Run VS Long run Dynamics

The ARDL results indicate that in the short run, exchange rate volatility has no statistically significant impact on remittance inflows. This suggests that Egyptian migrants do not respond immediately to fluctuations in the exchange rate, potentially adopting a cautious or delayed approach during periods of volatility.

However, inflation had a highly significant and negative effect on remittance inflows in the short term. This suggests that high domestic inflation discourages remittance transfers, possibly due to reduced purchasing power and perceived lower utility of remitted funds.

GDP growth exhibited a delayed effects second lag was positively and significantly associated with remittances. This may indicate that improvements in the domestic economy boost migrants' confidence and lead to increased remittances after a lag period.

However, in the long run The Bound Test confirmed cointegrating relationship exists between remittances and explanatory variables. Specifically, exchange rate volatility had a strong and statistically significant positive effect on remittance inflows in the long term. This may suggest that migrants respond to persistent or structural currency depreciation by increasing remittance transfers to support their families and protect them from economic instability.

Model Robustness

All diagnostic tests multicollinearity, serial correlation, heteroskedasticity, normality, and stability confirmed the robustness and reliability of the econometric model.

Discussion and Conclusion

This thesis aimed to explore the intricate dynamics of the relationship between remittance inflows and exchange rate volatility into Egypt for the period 2000-2023, a time characterized by significant economic reforms, turbulent currency devaluations, financial shocks globally and changing labor migration patterns. Given the importance of remittances in sustaining household consumption, providing resources to alleviate poverty, and augmenting Egypt's foreign exchange reserves, it is imperative to understand the determinants of remittances for effective economic policies.

Through the application of time-series econometrics, ARDL models, and cointegration analysis, our research uncovered robust evidence of a long-term equilibrium relationship between inflow of remittance and macroeconomic variables exchange rate volatility, inflation and GDP growth. Even though exchange rate volatility in the short term did not exhibit a statistically significant impact, the persistent association with remittances in the long term suggests that instability in the exchange rate may shape migrant behavior over time. In addition, inflation served as an important empirical short-term constraint to remittance inflows, demonstrating the extent to which declining inflationary pressures suppressed the

incentive to remit. The importance of lagged GDP growth also denotes a positive, albeit slow impact of the recovering economy on the remittance response.

Our results corroborate the findings of earlier works, including Ganem and Hashem (2024) as well as Yasin and Muhammad (2019), reinforcing how economic uncertainty and volatile currency rates erode trust in remittances. However, it also differs from some literature like Ahmed and ElSayed (2022) by demonstrating that depreciation does not, in and of itself, lead to heightened inflows, particularly in highly volatile contexts.

This study offers profound insights into policy formulation. For Egypt, to maintain and optimize the inflow of remittances through formal channels, the exchange rate needs to be stabilized junto with curbing inflation and allowing trust in the system to be rebuilt. Now that remittances continue to surpass the revenues obtained from traditional sources like the Suez Canal and foreign direct investments, maintaining their volatility becomes beyond financial, social and economic imperative.

To summarize, although remittances continue to be an important and stable element of Egypt's external finances, their responsiveness to macroeconomic factors, particularly the volatility of the exchange rate and inflation, reinforces the need for focus on transparent, consistent, and stability-oriented policy frameworks. Other researchers may build upon this work by analyzing microlevel household data, probing the motivations of remitters, or conducting cross-national studies in other economies that depend on remittances.

Limitations and Directions for Future Research

While this study provides valuable insights into the impact of exchange rate volatility on remittance inflows to Egypt, it is not without limitations. First, the analysis relies on aggregate annual data, which may obscure important short-term fluctuations or household-level behaviors. Second, the study focuses on macro-level variables and does not account for microeconomic or behavioral factors, such as migrant intentions, trust in financial institutions, or remittance channel preferences. Additionally, due to data availability, the model may not capture informal remittance flows, which are significant in Egypt.

Future research could address these gaps by using household-level or panel data to better understand the motivations and decision-making processes of remitters. Comparative studies across other remittance-dependent economies or incorporating structural breaks (e.g., major devaluation years) could also enhance understanding. Lastly, exploring the interaction between remittances and digital financial tools may offer new perspectives in an increasingly digitized remittance landscape.

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Rethinking User Interfaces in the Age of Artificial Intelligence

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Keywords

AI-enhanced user interfaces; User perception of AI; Human-AI collaboration

Abstract

As artificial intelligence (AI) continues to transform user interface (UI) design, understanding user perceptions and expectations of AI-powered interactions becomes increasingly important. This study uses thematic analysis of focus group discussions to investigate important themes around AI-enhanced user interfaces. The findings highlight six underlying themes: (1) user perception of AI, where familiarity with AI systems influences confidence and adoption; (2) transparency and explainability, highlighting users' demand for clarity in AI decision-making processes; (3) collaboration versus automation, emphasizing user preference for AI as an augmentative tool rather than a fully autonomous system; (4) inclusivity and accessibility, underscoring the need for adaptable, bias-conscious AI interfaces; (5) evolving interaction paradigms, showcasing users' shifting expectations of AI as a co-evolving assistant rather than a static tool; and (6) ethical and emotional considerations, revealing concerns over privacy, data security, and emotional attachment to AI systems. These findings inform future UI designs, advocating for customizable, transparent, and ethically responsible AI-driven interfaces that foster user trust and engagement.

Introduction

The use of artificial intelligence (AI) into user interface (UI) design is quickly changing how people interact with digital systems. AI-enhanced interfaces are progressively being integrated into everyday life, from voice assistants and recommendation engines to adaptive learning platforms and smart home gadgets. These technologies promise more efficiency, customization, and responsiveness, but they also introduce new challenges in how people perceive, trust, and interact with technology (Hering et al., 2025). This concern is particularly acute in high-stakes domains such as healthcare, finance, and public services, where opaque AI decisions can have significant consequences. Studies have shown that explainable AI (XAI) features, such as visual indicators, justifications, and feedback loops, can enhance user trust and satisfaction (Xie et al., 2023).

Another important consideration is the nature of human-AI collaboration. Rather than seeing AI as a substitute for human decision-making, many users prefer systems that function as intelligent assistants, supplementing rather than replacing human agency. Users perceive AI systems more positively when they engage in two-way communication, suggesting that co-creative and collaborative interaction models foster greater engagement and trust (Rezwana et al., 2022). This aligns with broader trends in HCI that advocate for participatory and user-guided AI design.

Simultaneously, ethical questions have become crucial to the debate over AI design, where ethical AI needs to be developed through interdisciplinary collaboration and built on concepts of fairness, accountability, and transparency. Ethical AI design must consider not only computational logic, but also the larger social and cultural settings within which AI operates. The *Ethics by Design* framework (Bayramoğlu, 2025) suggests incorporating ethical ideas into the design and development of AI systems, rather than treating them as an afterthought. Furthermore, emphasizes the necessity of ethics education and international cooperation in guaranteeing responsible AI deployment, particularly in sensitive sectors such as education and public services.

Despite these developments, we still don't fully understand how different consumers interpret and respond to AI-enhanced interfaces. Much of the existing research focuses on technical performance or isolated UX metrics, with less attention paid to the holistic, lived experiences of users interacting with AI

in real-world contexts. Moreover, issues of inclusivity, accessibility, and ethical design are often underexplored, particularly in relation to marginalized or underrepresented user groups.

This study addresses these gaps by conducting a thematic analysis of focus group discussions centred on user perceptions of AI-enhanced UIs. By capturing a wide range of user voices and experiences, the research aims to contribute to a more nuanced understanding of user expectations and inform the design of future AI-driven interfaces that are not only functional but also transparent, inclusive, and ethically responsible.

Background and Motivation

The incorporation of artificial intelligence (AI) into user interface (UI) design has sparked a new wave of interdisciplinary research into how consumers perceive, interact with, and assess AI-enhanced systems. User perception is a critical problem since it influences trust, adoption, and long-term involvement. Krägeloh et al. (2025) developed the Artificial Intelligence Attitudes Inventory (AIAI), which distinguishes between positive and negative attitudes about AI, indicating that these are not diametrically opposed but rather unique psychological constructs that influence user behavior in subtle ways. Similarly, Li et al. (2024) found that UX professionals perceive generative AI as both empowering and threatening, depending on their experience level and perceived agency, highlighting the emotional and cognitive tensions users face when engaging with AI systems.

Transparency and explainability have emerged as key elements in this discussion. According to Polignano et al. (2024), explainability must be combined with responsibility to be significant, particularly in high-stakes areas like healthcare and finance. Cheong (2024) further emphasizes that transparency is not merely a technical challenge but a legal and ethical imperative, requiring interdisciplinary governance frameworks to ensure AI systems safeguard individual and societal well-being. In educational contexts, Xie et al. (2023) demonstrate that explainable AI (XAI) features enhance trust and ethical integrity, particularly when users can query or challenge AI decisions. Beyond transparency, the nature of human-AI collaboration is evolving. Rezwana et al. (2022) found that users prefer co-creative interaction models where AI acts as an augmentative partner rather than a fully autonomous agent, fostering greater engagement and trust. This aligns with broader HCI trends advocating for participatory and user-guided AI design.

However, diversity and accessibility are still underexplored. While algorithmic fairness has received attention, interface-level inclusivity, such as adaptable UI elements for users with disabilities or varying levels of digital literacy, has not been sufficiently addressed. The Krägeloh et al. (2025) study also underscores the importance of demographic sensitivity, showing that attitudes toward AI vary significantly across age, education, and cultural background. As AI systems become more adaptive and context-aware, interaction paradigms are shifting from static command-response models to dynamic, co-evolving relationships. Spallazzo et al. (2025) introduced a framework to evaluate user experience in AI-infused systems, emphasizing the need for new metrics that capture the fluid, learning-based nature of these interactions.

On the other hand, ethical and emotional components are increasingly seen as essential to AI design. Bayramoğlu (2025) argues for *Ethics by Design* method, incorporating ethical concepts into AI system development to promote justice, transparency, and user empowerment. Li et al. (2024) also express concern about skill degradation, job displacement, and emotional tiredness among junior designers, emphasizing the importance of emotionally aware AI systems that promote rather than hinder human creativity. This literature highlights the numerous problems and potential in creating AI-enhanced UIs that are not only intelligent and efficient, but also transparent, inclusive, and ethically sound.

Methodology

This study takes a qualitative research approach, utilizing focus group sessions to investigate user perceptions and expectations of AI-driven interactions in user interface (UI) design. Thematic analysis was used to discover reoccurring themes in participant responses, resulting in a more structured and insightful data investigation.

A purposive sampling strategy was used to recruit participants with diverse backgrounds in technology use and AI familiarity. Purposive sampling, a non-random sampling technique, is used; where participants are intentionally selected based on specific characteristics or criteria that align with the study's objectives. A total of **12** participants were selected, ensuring representation across various user demographics, including age, profession, and AI experience. Participants were screened to ensure varying levels of exposure to AI-driven interfaces, allowing for a nuanced understanding of user perspectives.

Table1 illustrates the sample demographic characteristics.

Table1: Focus Group Participants' Characteristics

Category	Category	Count	Percent
Gender Distribution	Male	7	58%
	Female	5	42%
Age Group	18-26	2	20%
	27-35	3	25%
	36-44	3	25%
	45-60	4	30%
Educational Background	Undergraduate	2	20%
	Graduates	10	80%
Professional Background	MIS Student*	2	20%
	UI/UX Designer**	4	30%
	Software Engineer	3	25%
	General User	3	25%
Technological Familiarity	Frequent AI User	6	50%
	Occasional User	3	25%
	Limited Exposure	3	25%

*MIS: Management Information Systems

**UI/UX: User Interface/ User Experience

Two focus group sessions were conducted online on Zoom, each lasting approximately **90** minutes, and each included **6** participants. Session were moderated by the researcher, a trained facilitator who guided discussions using semi-structured interview protocols. Questions were designed to prompt participants to reflect on their experiences, concerns, and expectations regarding AI-enhanced UI interaction. Discussions were recorded and transcribed for accuracy.

Since the goal was to explore themes rather than impose preconceived categories, the questions were designed to be open-ended and neutral, allowing participants to naturally reveal their thoughts without being guided toward specific themes, these questions were as follows:

1. "Can you share any experiences you've had with AI-driven interfaces? What stood out to you whether positive or challenging?"
2. "How do you generally feel when interacting with AI in digital spaces? What influences those feelings?"
3. "What do you expect from AI-enhanced interfaces? Have your expectations changed over time?"
4. "If AI could evolve better align with users' needs, what would you want to change or improve?"
5. "Are there any concerns or thoughts you've had about AI in interfaces that you think deserve more attention?"

Thematic Analysis

A thematic analysis approach was employed, following Braun & Clarke's (2006) six-step framework: Familiarization in the data; Generating Initial Codes; Searching for Themes; Reviewing Themes; Defining and Naming Themes; and Reporting Findings. This process was conducted through the following systematic steps:

- Each focus group session was transcribed verbatim
- The researcher went through transcripts carefully, identifying recurring statements, descriptions, and opinions expressed by users.
- Relevant portions of the text were labeled with specific codes that capture the essence of participant remarks. These labels function as data tags, categorizing statements that reflect user sentiment, concerns, or expectations toward AI-enhanced UIs.

- Codes are analyzed for similarities and overlaps. Codes are consolidated into broader themes that represent patterns across discussions. For example:
 - Statements describing hesitation in trusting AI recommendations may be grouped under the broader theme of "Trust in AI."
 - Conversations about the ability to control AI system behavior might be categorized under "User Adaptability."
 - Comments related to AI assisting rather than replacing users can contribute to the theme "Collaboration Preferences."

Results

Based on thematic analysis of the focus group discussions, the following themes were explored. Quotations from the focus groups are marked in italic.

User Perception of AI-Enhanced UIs

This theme is particularly important because user expectations and comfort levels vary based on prior experience with AI-driven technologies. Participants familiar with AI-powered systems, such as smart assistants, recommendation algorithms, and automated workflows, expressed greater confidence in the ability of AI to enhance their interaction with digital systems. Conversely, users who have little experience or negative past interactions with AI expresses *"skepticism, particularly concerning AI transparency and decision-making logic"*.

Majority of participants articulate a desire for greater **control over AI** features in interfaces, preferring designs that allow for *adjustable levels of automation rather than systems that automatically assume user intent without explicit input*. Significant discussion was conducted around the balance between user agencies and AI-driven automation, whether AI should act as a background assistant that learns passively or as an interactive entity that adapts dynamically based on direct user guidance. Few participants expressed that they feel *"overwhelmed by fully autonomous systems, preferring a hybrid approach where AI suggests options rather than executing tasks without human verification"*.

An interesting counterpoint to this finding comes from the study of Müller and Maier (2024), suggesting that when users were given less control over AI functions, they performed worse in decision-making tasks compared to those who had more control. This study suggests that while many users may *say* they want more control, limiting user intervention might lead to better outcomes in certain contexts, particularly when the AI is demonstrably competent.

Transparency and Explainability

Participants highlighted their discomfort with AI systems that function as *black boxes* producing decisions or recommendations without providing **clear reasoning or explanations**. Participants reached consensus that this concern is particularly relevant in industries such as healthcare, finance, and security, where AI-driven automation has significant implications. All participants expressed the need for *explainable AI (XAI)* features, such as visual indicators that clarify how and why an AI system arrived at a particular recommendation.

A discussion was raised around threshold for acceptable **AI transparency**, how much explanation is enough before an interface becomes overly complex? Half of users expressed preference *"streamlined interactions with minimal AI interruptions"*, while others advocate for *"in-depth reasoning behind each decision, particularly in high-stakes scenarios"*. A potential insight from the thematic analysis is that users appreciate *progressive disclosure*, where AI explanations are optional and available when needed rather than intrusive and constant. Users also discussed trust-building mechanisms, such as AI interfaces incorporating feedback loops, where users can query or correct AI decisions, thus fostering a more interactive relationship. This finding supports the recommendation of Muralidhar et al. (2024) study which highlighted that users value diverse explanation methods and that feedback mechanisms, such as the ability to query or adjust AI outputs, enhance trust and engagement.

Collaboration vs. Automation

During focus group, a debate between AI automation and **human-AI collaboration** was raised. A key finding from the analysis suggested that collaboration-based AI features, such as real-time adaptability,

predictive assistance, and user-guided AI behavior adjustments, are significantly more desirable than purely automated systems. Participants of the focus groups articulate a vision for AI-driven interfaces *"where suggestions feel like teamwork rather than instruction-based automation"*.

Many users express a strong preference for AI systems that provide an assistant rather than replacing human decision-making entirely. This perspective aligns with the argument in the academic paper that AI should augment human agency rather than supplant it (Rezwana et al., 2022). Participants in the focus groups emphasize the importance of *"customizable AI interactions, allowing individuals to dictate whether AI is playing a suggestive, interactive, or autonomous role within the interface"*. Additionally, participants working as designers raised the concern that excessive automation over-personalizes or preempts user intent, potentially reducing user engagement with their own processes.

Inclusivity & Accessibility

Given the diversity of participants in the focus groups, another theme raised the need for inclusive AI-enhanced UI design. The discussion revealed varied preferences and accessibility needs across different user groups. Participants who are highly tech-literate expressed excitement about advanced AI-enhanced interfaces with customizable workflows and automation. Conversely, users who are less comfortable with complex technology requested *"intuitive, simplified designs that enable easy onboarding and gradual learning"*. This thematic finding supports the argument that next-generation AI interfaces must prioritize inclusivity and adaptable UI for users with varying needs and abilities (Zytka et al., 2022).

One of the most critical discussions may center around **bias in AI systems**. Some participants could highlight concerns that AI-based interfaces do not adequately represent diverse user experiences, particularly for individuals from underrepresented communities or those with disabilities. Algorithmic bias is expected to be an issue raised by participants, who may call for more equitable AI training datasets to ensure AI systems do not inadvertently disadvantage specific user groups.

Evolving Interaction Paradigms

AI-enhanced systems allow for dynamic learning, where AI continuously adjusts interactions based on user behavior and feedback. This raises fundamental questions about what users truly want from AI-powered interfaces. Participants in the focus groups expressed enthusiasm for systems that function as **interactive assistants**, rather than passive tools. There may be considerable discussion around trust-building mechanisms within interfaces, where AI progressively learns user preferences while allowing course correction. Some participants described an ideal AI interaction model as a *"co-evolving relationship,"* where the UI and adapt to one another over time. Other participants showed preference for conversational AI interfaces, where AI respond in natural language, ask clarifying questions, and adjust its suggestions in real time.

Ethical & Emotional Considerations

The final theme revolves around ethical concerns and emotional responses to AI-enhanced interfaces. Some participants demonstrated **emotional attachment to AI-driven systems**, particularly when they interact with personal AI assistants, chatbots, or adaptive UIs regularly. Participants described scenarios where AI interfaces become an integral part of their workflow, enhancing productivity or even offering emotional comfort in cases where AI functions as a social support system.

A strong viewpoint was raised regarding **privacy and data transparency**, with participants discussing *apprehension about AI-driven decision-making* and **data usage policies**. Some participants questioned whether AI-enhanced UIs are secure and ethically designed, particularly regarding personal data protection and the *risk of AI-driven manipulation*. An important insight from the thematic analysis was that users seek *more control over AI data collection practices*, preferring systems that provide clear options for *data opt-in, selective personalization, and user-managed transparency settings*.

Conclusion

This study explored user perceptions and expectations surrounding AI-enhanced user interfaces through a thematic analysis of focus group discussions. The findings reveal a nuanced landscape of attitudes shaped by prior experience, trust, and individual needs. Participants emphasized clear

preference for interfaces that allow adjustable levels of automation rather than fully autonomous systems. This highlights a growing demand for hybrid interaction models where AI acts as a supportive collaborator rather than a directive force.

The tension between automation and collaboration further underscores the need for customizable AI roles within interfaces. Participants favored systems that adapt to user input and context, reinforcing the argument that AI should augment rather than replace human decision-making. This aligns with broader ethical considerations, as users expressed a desire for inclusive, accessible, and equitable AI systems that respect diverse needs and mitigate algorithmic bias.

A recurring concern across themes was the transparency and explainability of AI systems. Participants consistently voiced discomfort with opaque decision-making processes, particularly in high-stakes domains. The preference for progressive disclosure, where explanations are available but not intrusive, emerged as a promising design principle for balancing usability with accountability.

Finally, the discussions revealed a shift in interaction paradigms, with users envisioning AI not as a static tool but as a co-evolving partner capable of learning and adapting over time. This vision is tempered by ethical concerns, particularly around data privacy and emotional reliance, suggesting that future AI interfaces must be designed with transparent data practices and user empowerment at their core.

In sum, the findings advocate for a human-centered approach to AI-enhanced UI design, one that prioritizes trust, adaptability, inclusivity, and ethical integrity. These insights offer valuable guidance for designers, developers, and policymakers aiming to create AI systems that are not only intelligent but also responsible and responsive to the people they serve.

Limitations and Future Work

Despite its contributions, this study faces several constraints:

Firstly, focus group findings are shaped by participants' personal experiences, biases, and expectations. Some participants might base their views on limited exposure to AI-enhanced UIs, leading to variability in responses that could make generalization difficult. On the other hand, the focus group setting itself presents potential biases, where more outspoken participants may influence quieter individuals, leading to an overrepresentation of certain viewpoints. Secondly, while efforts were made to ensure diverse participation, the study did not fully capture perspectives from highly specialized fields (e.g., healthcare, finance) or underrepresented populations (e.g., individuals with disabilities who rely heavily on AI-driven accessibility tools). The size and composition of the focus groups might not reflect the broader global user base.

Building on the findings of this study, future research could address these limitations through expanded methodologies such as large-Scale Quantitative Studies, and/or user Experimental Testing with Real AI Systems, incorporate user interaction experiments with prototype AI-enhanced UIs, while measuring user efficiency, satisfaction, and trust across different UI configurations.

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Review of the use of text mining in food price prediction and food security models: A Semantic AI approach

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Abstract

The increasing volatility of food markets requires more responsive and accurate forecasting models to support effective policy decisions and ensure adaptation to the market. While traditional forecasting methods in agriculture rely heavily on structured quantitative data, they often overlook the latent predictive signals embedded in unstructured textual sources such as news, social media posts, government reports, and expert insights. Same, for food security value chain that covers primarily food production, distribution, and consumption, text mining techniques can help identify trends, sentiment polarity, political and market directions.

This paper systematically reviews research in the domain of integrating text mining techniques with quantitative food price prediction and food security models. We conduct a structured literature search across multiple academic databases, applying inclusion criteria that emphasize methodological transparency, empirical validation, and relevance. To extract dominant research themes, we used generative AI tool to summarize the research papers we collected. Informative summaries were generated. Then we employed a topic modeling approach that builds on sentence-BERT embeddings and k-means clustering. This provided grouping of issues found in the research papers while ensuring rich semantic relevance. Then with the use of generative AI tool, titles were generated for each group, these represent thematic research themes. Results highlight the growing use of LSTM and hybrid forecasting models, topic modelling, sentiment analysis and domain-specific transformers in agri-food modelling. With more emphasis on sentiment analysis for food price forecasting, and more emphasis on information extraction, text clustering and trend analysis for food security. Our findings underscore the potential of text-augmented models to enhance the timeliness, contextual awareness, and accuracy of food price forecasts and food security models.

Introduction

Accurate forecasting of agricultural prices and food security indicators are a cornerstone of effective policymaking, market regulation, and humanitarian planning. Traditional quantitative models, while robust in handling structured data such as historical prices and climatic variables, often fall short in capturing the dynamic, real-time signals embedded in unstructured textual data. Text mining techniques, that cover Natural Language Processing (NLP) and recently large language model architectures, provide several benefits when integrated with food price prediction. They incorporate into the forecasting process, qualitative signals from news, articles, social media posts, government reports and expert feedback.

Recent research has demonstrated that textual data can significantly enhance the predictive and adaptive power of time series models. For instance, sentiment analysis of agricultural news and social media posts has been shown to improve commodity price forecasts by capturing market expectations and behavioral cues (Xu & Hsu, 2022). Similarly, topic modeling and semantic analysis have been used to detect early warnings of supply chain disruptions and policy shifts that influence food prices (Wihartiko et al., 2021).

In the agricultural domain, the application of NLP is gaining momentum. Research has explored the use of transformer-based models such as BERT and its variants for tasks ranging from crop disease detection to semantic classification of agricultural documents (Reimers & Gurevych, 2019). Moreover, hybrid models that combine deep learning architectures with text-derived features, such as keyword vectors or sentiment scores have shown measurable improvements in forecasting accuracy for agricultural exports and inflation trends (Xu & Hsu, 2022).

Despite these advances, the integration of text-based insights into quantitative forecasting remains underexplored in agriculture compared to domains like finance or marketing. A recent review by Wihartiko et al. (2021) highlighted that while deep learning models and data mining techniques are increasingly used in agricultural price prediction, the role of unstructured text data is still emerging. Similarly, the Frontiers Research Topic on Semantics and NLP in Agriculture underscores the untapped potential of semantic technologies in addressing agri-business concerns through text analytics.

This paper aims to fill this gap by systematically reviewing the literature on integrating text-based methods in food price prediction and food security models. Through this synthesis, we aim to map the current methodological landscape, identify key NLP techniques and architectures in use for agri-business analysis, and inform future work in this interdisciplinary field.

Literature Review

Food Price Forecasting

The increasing volatility of food prices, driven by global disruptions, climate change, and market speculation, has prompted researchers to explore advanced forecasting techniques. Among these, text-based forecasting methods have gained prominence for their ability to incorporate unstructured data such as news articles, social media posts, and search trends into predictive models. This section reviews and compares recent studies that integrate textual data into food price forecasting, highlighting methodological innovations, data sources, and forecasting performance.

Jayadianti et al. (2023) focused on forecasting staple food prices in Indonesia using Long Short-Term Memory (LSTM) networks trained on three years of historical price data. Their model demonstrated strong generalizability across ten commodities and was proposed as a decision-support tool for regional inflation control. Notably, this study did not incorporate textual data, serving as a baseline for comparison with more complex, text-integrated models. In contrast, Zhang et al. (2025) introduced a hybrid model combining Graph Convolutional Networks (GCN), Bidirectional Gated Recurrent Units (BiGRU), and Tree-structured Parzen Estimators (TPE). This model captured both structural and temporal dependencies in agricultural futures data, achieving high predictive accuracy ($R^2 = 0.969$). Although it did not explicitly use textual data, its architecture reflects the trend toward multi-dimensional modeling.

Several studies explicitly integrated textual data. Chuluunsaikhan et al. (2020) used Latent Dirichlet Allocation (LDA) to extract topics from South Korean news articles related to pork, which were then used to train LSTM models. The study found a strong correlation between news content—especially disease-related events—and pork price fluctuations, demonstrating the predictive value of media sentiment. Wang and Liu (2025) advanced this approach by combining BERTopic and FinBERT to extract topic and sentiment features from Chinese news headlines about soybean futures. These features were fused with market data and modeled using a hybrid HMM-LSTM architecture (the application of Hidden Markov Models/HMM and Long Short-Term Memory (LSTM) neural networks). The model outperformed baselines, particularly during periods of market disruption, highlighting the value of sentiment-aware forecasting.

Social media data also featured prominently. Inoue and Nakajima (2024) analyzed tweets to assess consumer awareness of New Zealand kiwifruit in Japan. Using text regression and time-series analysis, they demonstrated that social media sentiment significantly influenced export performance. Similarly, Wang et al. (2024) used Weibo data and ChineseBERT to construct a sentiment index for corn futures forecasting. Their model incorporated signal decomposition and SHAP analysis, achieving high accuracy over 30- and 60-day horizons.

An et al. (2024) proposed a multi-modal ensemble model that integrated news text, Baidu search trends, and historical prices to forecast soybean futures. A sentiment intensity index reflecting investor

concern was embedded into a multi-task autoencoder, yielding superior performance in both short- and medium-term forecasts. Li et al. (2022) developed a framework using DP-Sent-LDA and Bi-LSTM to extract sentiment and topic features from online news headlines. These were input into SVR and BPNN models, which outperformed traditional benchmarks in forecasting soybean futures.

Commonalities across these studies include the widespread use of LSTM-based architectures, the integration of sentiment and topic modeling techniques, and a focus on commodities like soybean, corn, and pork. Most studies demonstrated that incorporating textual data—especially sentiment features—significantly improves forecasting accuracy. Discrepancies arise in data sources and modeling complexity. While some studies relied solely on historical price data (e.g., Jayadianti et al., 2023), others integrated multi-source textual data (e.g., An et al., 2024). The sophistication of text analysis also varied, from basic LDA (Chuluunsaikhan et al., 2020) to advanced models like FinBERT and BERTopic (Wang & Liu, 2025). Furthermore, while some models focused on short-term forecasting, others addressed medium- and long-term horizons. The following section analyze the methodologies, data sources, and findings across the reviewed studies.

Model Architectures and Hybrid Techniques:

Following is a comparison of the machine learning and deep learning models used across studies, emphasizing hybrid and ensemble approaches.

- Text Processing Techniques: Topic modeling (LDA, BERTopic), sentiment analysis (FinBERT, Bi-LSTM), and text regression.
- Deep Learning Models: LSTM (Jayadianti et al., 2023; Chuluunsaikhan et al., 2020), BiGRU (Zhang et al., 2025), Bi-LSTM (Li et al., 2022).
- Hybrid Models: GCN-BiGRU-TPE (Zhang et al., 2025), HMM-LSTM (Wang & Liu, 2025), and multi-modal ensemble models (An et al., 2024).
- Optimization Techniques: Use of Optuna for hyperparameter tuning and SHAP for interpretability (Wang et al., 2024).

Sentiment and Topic Integration:

It is important to note how sentiment and topic features are extracted and integrated into forecasting models.

- Sentiment Index Construction: Raw vs. denoised sentiment indices (Wang et al., 2024), investor concern-based sentiment (An et al., 2024).
- Topic Modeling: LDA (Chuluunsaikhan et al., 2020), DP-Sent-LDA (Li et al., 2022), BERTopic (Wang & Liu, 2025).
- Impact on Forecasting: Studies consistently show that integrating sentiment and topic features improves short- and medium-term forecasting accuracy.

Data Sources and Market Contexts:

In the following we show geographical and market contexts of the studies and the types of commodities forecasted, and the sources of textual data used.

- Geographical Focus: China (Wang et al., 2024; Li et al., 2022), South Korea (Chuluunsaikhan et al., 2020), Indonesia (Jayadianti et al., 2023), Japan (Inoue & Nakajima, 2024).
- Commodity Types: Pork, corn, soybean, and general food commodities.
- Data Types: Historical price data, news articles, social media content, and search engine trends.
- Textual Sources: News headlines (Li et al., 2022; Wang & Liu, 2025), tweets (Inoue & Nakajima, 2024), and social media platforms like Weibo (Wang et al., 2024).

Challenges and Research Gaps

Limitations and areas for future research are highlighted as follows.

- Challenges:
- Limited generalizability across regions and commodities.
- Difficulty in quantifying non-market factors

- Lack of real-time data integration.
- Research Gaps:
- Underexplored commodities and regions.
- Need for explainable AI in forecasting.
- Integration of multimodal data (e.g., images, satellite data).

Food Security

Recent scholarship on food security reflects a growing convergence around the use of advanced technologies and interdisciplinary approaches to address global food challenges. A significant body of work emphasizes the role of machine learning (ML) and artificial intelligence (AI) in enhancing food system resilience. Jarray et al. (2023) and AbdulKader et al. (2024) provide comprehensive reviews of ML and remote sensing applications in crop yield prediction, land mapping, and sustainable agriculture, aligning with SDG-2. These studies underscore the potential of AI to process heterogeneous data and support decision-making in rural ecosystems. Complementing this, Reddy et al. (2024) integrate healthcare data modeling with food safety analysis, highlighting the intersection of public health and food security. Their work demonstrates how deep learning can detect food adulteration and trace foodborne illness patterns, offering a novel perspective on urban food safety.

Text mining emerges as another critical tool. Xiong et al. (2024) and Vasilescu et al. (2024) explore its application in food quality control, policy analysis, and public consultation. Ma and Zheng (2025) apply sentiment analysis to social media data, revealing how public opinion can influence food safety responses during crises like the “Rat-Headed Duck Neck” incident. Economic dimensions are addressed by Silva et al. (2024) and Pratap et al. (2022), who develop nowcasting models and sentiment-based forecasting tools to monitor food price inflation. These models are vital for timely policy interventions, especially in volatile markets.

In contrast, Leroy et al. (2015) focus on household-level food access, advocating for experience-based and dietary diversity indicators. Their work highlights the need for low-burden, validated tools for large-scale surveys. While all studies converge on the importance of data-driven approaches, they differ in scale, methodology, and focus, ranging from macroeconomic modeling to micro-level access indicators. This diversity reflects the complexity of food security and the need for integrated, context-sensitive solutions.

Technological Integration and Innovation

A major convergence across studies is the application of AI, ML, and remote sensing to enhance food security. Jarray et al. (2023) and AbdulKader et al. (2024) both emphasize the use of ML for crop yield prediction and sustainable agriculture. However, while Jarray et al. focus on a systematic review of ML models across global contexts, AbdulKader et al. propose a specific GIS-based model tailored to rural ecosystems, achieving high predictive accuracy. Reddy et al. (2024) extend this technological lens by integrating healthcare data with food safety monitoring, using deep learning to detect food adulteration and trace foodborne illnesses. This study uniquely bridges public health and food security, unlike the others which focus more on agricultural productivity.

Public Sentiment and Communication

Ma and Zheng (2025), Xiong et al. (2024), and Vasilescu et al. (2024) explore the role of text mining and sentiment analysis. Ma and Zheng analyze Weibo data during a food safety crisis, showing how public sentiment can escalate or mitigate food-related emergencies. Xiong et al. provide a broader survey of text mining applications in food quality and personalization, while Vasilescu et al. use quantitative text analysis to map stakeholder positions in food policy debates. The common thread is the use of unstructured textual data to inform food safety and policy, but they differ in scope: Ma and Zheng focus on crisis response, Xiong et al. on industry applications, and Vasilescu et al. on regulatory influence.

Economic Monitoring and Price Volatility

Silva et al. (2024) and Pratap et al. (2022) address food price inflation using real-time data. Silva et al. develop nowcasting models to detect inflationary trends, while Pratap et al. incorporate media sentiment

to improve forecasting accuracy for volatile commodities like tomatoes and onions. Both studies highlight the importance of early warning systems, but Pratap et al. uniquely integrate climate and media data, offering a more holistic model.

Measurement and Indicators of Food Access

Leroy et al. (2015) take a different approach by focusing on household-level food access indicators. They critique existing metrics and recommend experience-based and dietary diversity indicators for large-scale surveys. Unlike the tech-heavy studies, this work emphasizes low-burden, validated tools for assessing food access, particularly in vulnerable populations.

Methodological and Contextual Differences

- Scale: Some studies operate at a macro level (e.g., Jarray et al., Silva et al.), while others focus on micro or household levels (e.g., Leroy et al.).
- Data Types: There's a divide between studies using structured data (e.g., satellite imagery indicators, price indices) and those leveraging unstructured data (e.g., social media, policy texts).
- Outcomes: While some aim to predict and prevent (e.g., crop insufficiency, price spikes), others aim to understand and respond (e.g., public sentiment, policy influence).

Research Methodology

To systematically identify and analyze relevant literature on text-based food forecasting methods, this review employed a structured search strategy across multiple academic databases. Key sources included ScienceDirect, Elsevier, Wiley, SpringerLink, Sage, ResearchGate, and Google Scholar, chosen for their comprehensive coverage of peer-reviewed journals and conference proceedings. The search process utilized Boolean operators and targeted keyword combinations to ensure relevance and precision, including the following:

- "text mining" AND "food price prediction"
- "natural language processing" AND "agricultural price forecasting"
- "news sentiment" AND "food price forecasting"
- "social media" AND "food price prediction"
- "text-based" AND "commodity prices"

The food analysis domain does not only cover price predictions, but it handles issues related to food security in general. This covers market analysis, early warning systems for food security crises, such as famines or foodborne disease outbreaks, etc. Also, estimations of inflation levels are a common concern in food security. This made us search for text-based methods in food security analysis, beside food price prediction. We used Boolean operators and targeted keyword combinations to ensure relevance and precision, including the following:

- "text mining" AND "food security"
- "natural language processing" AND "food security"
- "sentiment" AND "food security"
- "social media" AND "food security"
- "text-based" AND "inflation"
- "sentiment" AND "inflation"

Inclusion criteria focused on studies that integrated textual data, such as news articles, social media posts, or government reports, into forecasting models and food security analysis. Studies that lacked methodological transparency were excluded. This approach ensured a focused and high-quality selection of literature, enabling a comprehensive synthesis of current methodologies in the domain under study.

To detect the main topics discussed in the research papers, we applied a topic modelling approach based on large language model embeddings; Sentence-BERT (SBERT) (Reimers & Gurevych, 2019). SBERT is a modification of the pretrained BERT network to derive semantically meaningful sentence embeddings that can be compared using cosine-similarity. It reduces the time for finding the most similar pair from 65 hours with BERT to about 5 seconds with SBERT, while maintaining accuracy. In this research we used the 'all-MiniLM-L6-v2' model, a powerful SBERT representation capable of mapping

sentences and paragraphs to a 384-dimensional dense vector space that captures the semantic information of the input. It is useful for tasks like information retrieval, clustering, and sentence similarity detection. Unlike other text embeddings such as word2vec and Glove, SBERT enriches word representations with contextual information.

The research approach adopted in this study includes (1) collecting the research papers with the criteria discussed above to ensure methodical underpinning, (2) generating informative summaries for the research papers using generative AI tool (600 words-length summaries were found suitable to reflect the research content), (3) converting the research summaries into sentence embedding; 'all-MiniLM-L6-v2' was chosen, (4) clustering the sentence embeddings into groups, (5) generating titles to each group using generative AI tool, and finally (6) retrieving from the research papers most relevant paragraphs related to the titles generated; for this task 'all-mpnet-base-v2' model was used.

The all-SBERT models were trained on all available training data (more than 1 billion training pairs). The 'all-mpnet-base-v2' model provides the best quality, as it maps sentences to a 768-dimensional dense vector space, in contrast to 'all-MiniLM-L6-v2' that uses 384-dimensional vector representation. In retrieving relevant paragraphs related to the generated cluster titles we used 'all-mpnet-base-v2' as we wanted to ensure richness of semantic representation and most accurate results, whereas in the clustering part we used a less dimensional representation 'all-MiniLM-L6-v2' to ensure generalizability and high level abstraction that is required for the clustering task.

The clustering algorithm we used was k-means with a maximum of 300 iterations. We calculated inertia values to decide the optimal number of clusters. Compared to other clustering methods, such as density and hierarchical clustering, k-means produces more coherent and well-distributed topics. As a result, we obtained clusters corresponding to different topics discussed in the research papers.

For these clusters we generated titles using generative AI tool, and for each title we extracted the most relevant paragraphs from the research papers through semantic information retrieval. This resulted in a 'roadmap that reflects current research status and concerns in the field of integrating text-based analysis with quantitative food price prediction and food security models'. As the analysis is carried out using well-proven sentence embeddings, it is more accurate than the human being to depict the recurrent research themes. We also used the state-of-the-art in sentence embeddings and generative AI tools that produce summaries and titles. This made the analysis more informative than just ending up with most frequent words or expressions in the research papers. Furthermore, we calculated the TFIDF score for the text included in each cluster, this gave us the weight for each cluster according to the perspective of the papers.

The thematic titles reflect the research concerns handled in the papers, and implicitly cover the buzzwords for this research domain. The buzzwords are the nouns in the titles, and we calculated a normalized repetition score for each buzzword by dividing the number of its occurrence by the number of characters of the papers it appeared in.

Results

After we followed the methodology explained in previous section, the generative AI tool provided the titles for both food price prediction and food security clustered themes (Figure1 and Figure2). Using the semantic information retrieval approach explained before, we extracted the most relevant paragraphs from the papers that match these titles/themes. In the following we provide the major issues found for these thematic titles.

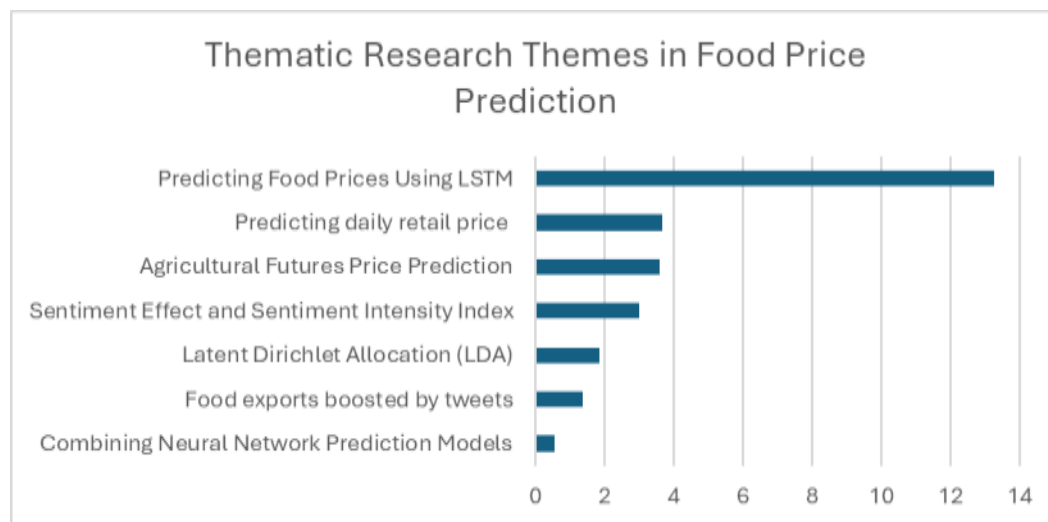


Figure1: Thematic Research Themes for Food Price Prediction

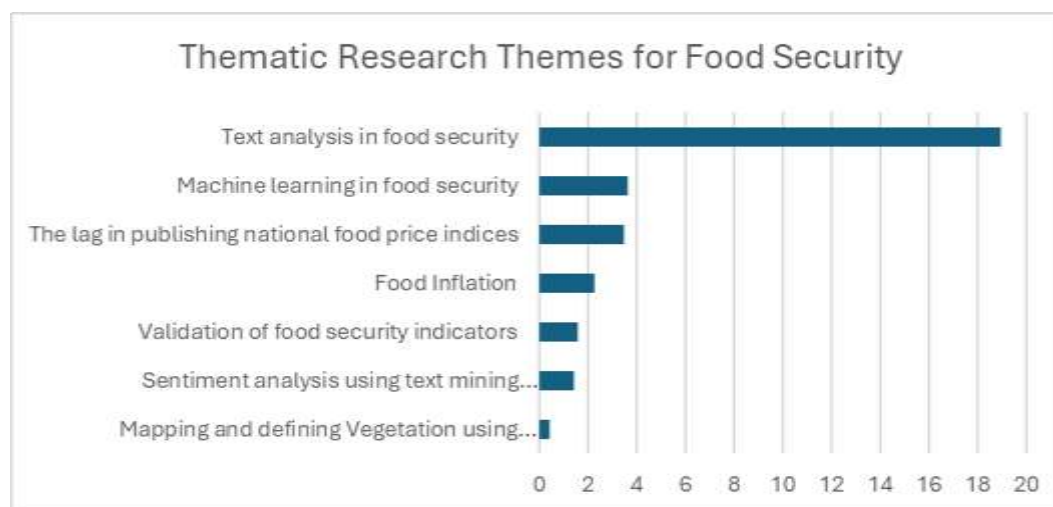


Figure2: Thematic Research Themes for Food Security

Food Price Forecasting Themes

Predicting Food Prices Using LSTM

- LSTM forecast can be used to develop a more accurate and reliable food price prediction model (Jayadianti et al., 2023)
- The outcome of this research is the implementation of an LSTM model architecture for price forecasting and analysis of ten food commodities (Jayadianti et al., 2023)
- The results demonstrated that the proposed LSTM architecture model was generalizable to all commodities and performed well in most cases (Jayadianti et al., 2023).
- The Bi-LSTM model excels in extracting information related to the order of words in a sentence, and thus is used in sentiment analysis (An et al., 2024).

Predicting daily retail price

- There are four types of price data, i.e., the retail price, marketplace price, distribution price, and auction price (Chuluunsaikhan et al., 2020)
- A methodology that predicts the daily retail price of pork in the South Korean domestic market. They utilized news articles and retail price data. Initially a topic modeling technique is carried out to obtain relevant keywords that express price fluctuations. Based on these keywords, a prediction models is constructed using statistical, machine learning, and deep learning methods (Chuluunsaikhan et al., 2020).

Agricultural Futures Price Prediction

- The accurate forecasting of agricultural product futures prices is crucial for farmers, traders and policymakers. (Zhang et al., 2025)
- Predictions enable farmers and businesses to adapt to market changes and safeguard their economic interests. (Zhang et al., 2025)
- Accurate agricultural futures price forecasts can guide the formulation and adjustment of government policies. (Zhang et al., 2025)
- Three main approaches for agricultural product futures price are suggested; traditional forecasting methods, machine learning methods, and combined forecasting models. (Zhang et al., 2025)

Latent Dirichlet Allocation (LDA)

- Topic modeling is a type of natural language processing (NLP) for extracting abstract topics from text data. (Chuluunsaikhan et al., 2020)
- LDA is a tool applied to uncover latent topics for a large corpus. Documents are represented by a mixture of topics, where a topic is a probability distribution over the set of words. (Guindani et al., 2024)
- After the data cleaning, words are extracted according to their parts of speech using KoNLPy. Subsequently, a bag-of-words (BoW) model was created using the result of PoS tagging. The BoW model is the numerical representation of text data, and the output is used in LDA modelling. (Chuluunsaikhan et al., 2020)
- In contrast to BoW-based LDA, Sentence Latent Dirichlet Allocation (Sent-LDA) is proposed that assumes that all words in one sentence are sampled from the same topic. (Li et al., 2022)
- The LDA model returns K number topics, which include M number of words. It is necessary to set K manually, and this is a limitation of the LDA method. (Chuluunsaikhan et al., 2020)

The Sentiment Effect in the Agriculture Futures Market / Constructing a Sentiment Intensity Index Taking into account Investor Concern

- For all agricultural futures investigated, contagious sentiment and idiosyncratic sentiment is significantly and positively associated with futures returns. Contagious sentiment has a considerable impact. Neither domestic nor global stock market sentiment is significantly correlated with futures return (Li et al., 2025).
- Studies stress the use of a 14-day RSI (relative strength index) as a sentiment proxy to construct the sentiment index (Li et al., 2025).
- Sentiment intensity analysis primarily involves the utilization of sentiment-based analysis methods that classify news text using domain-specific sentiment toolkits (An et al., 2024)
- For soybean futures price prediction, the predictive abilities of the proposed sentiment intensity that considers investor concerns are high (An et al., 2024).
- Investor sentiment plays a significant role in influencing trading activities (An et al., 2024).

Food exports boosted by tweets

- The reason for using tweets as a proxy of consumer evaluation is their usefulness for food consumption research. (Inoue et al., 2024)
- It proposes to combine tweets with outcome variables using a time-series analysis. (Inoue et al., 2024)

- A tri-variate vector autoregression (VAR) model was used consisting of net imports of Kiwifruit from New Zealand, unit import price and tweets (Inoue et al., 2024)
- This helped New Zealand to outline its export marketing strategy (Inoue et al., 2024)

Combining Neural Network Prediction Models

- Combining graph convolutional network (GCN) with bidirectional gated recurrent unit (BiGRU) is proposed, and are integrated through tree-structured parzen estimator (TPE). (Zhang et al., 2025)
- Experiments are conducted on a real corn futures dataset, and GCN-BiGRU-TPE shows better prediction performance than traditional machine learning models, single deep learning models, and other hybrid models. (Zhang et al., 2025)
- The neural basis expansion analysis with exogenous variables is improved by designing a weight coefficient and Optuna is used to optimize the designed weight coefficient and the hyperparameters (Wang et al., 2024)

Food Security Themes

Text analysis in Food Security:

- Text classification, a critical part of NLP, aims to automatically categorize textual information into specified taxonomies. Common tasks cover; semantic information retrieval, data filtration, topic modelling, text clustering, Named Entity Recognition (NER) and sentiment analysis (Xiong et al., 2024).
- Text classification models analyze textual data gathered from diverse sources, such as news articles, social media, and online forums.
- Common ML techniques cover; Support Vector Machines (SVMs) and Bayesian classifiers (BC). SVM, grounded in statistical learning theory, excel in intricate classification within high-dimensional feature spaces. Whereas, Bayesian classifiers are less computationally demanding and get good results with limited training sets (Xiong et al., 2024).
- Deep learning-based models provide rich semantic representation of food issues. BERT has demonstrated remarkable potential in text classification and in the food domain, it is used in tasks like food safety supervision and food category text classification. (Xiong et al., 2024).
- The dynamic topic modeling capability of BERTopic extends static text analysis, and allows to observe evolving thematic trends over time (Ma et al., 2025).
- BERTopic model is not only adept at analyzing short texts but also proficient in uncovering the profound semantic structures and temporal evolution of events (Ma et al., 2025).
- News items were filtered that contain at least one keyword from the set of commodity, supply-demand and price-related keywords (Pratap et al., 2022).
- Evolution of Opinion Probabilities serve as a reminder of the importance of managing public emotions and implementing information dissemination strategies in food safety incidents (Ma et al., 2025).

Machine Learning in Food Security:

- ML techniques are playing a crucial role in supporting decision-making in food security applications (Jarray et al., 2023).
- ML techniques in food security cover cropland mapping, crop type mapping, yield forecasting and field delineation (Jarray et al., 2023).
- Several ML techniques were discussed; Support Vector Machines, Random Forest, XGBoost and Kmeans. DL techniques in food security cover; CNN, LSTM, GRU and RNN (Jarray et al., 2023).
- ML application classification, the challenges and future directions, and importance is derived from the fundamental role that food security plays in ensuring a sustainable and equitable future. (Jarray et al., 2023)

Lag in publishing national food price indices/Nowcasting

- Food prices are a complex phenomenon that is influenced by various demand and supply factors. Fluctuations in food prices have the potential to disrupt both international and local market stability (Silva et al., 2024).

- Challenges are posed by the lag in publishing national food price indices and monitoring abnormal growth in food prices worldwide (Silva et al., 2024).
- Nowcasting Food Prices Module provides insights into the current state and trends of food prices at regional, country or territory levels (Silva et al., 2024).
- The proposed nowcasting model utilizes diverse data, ranging from standard variables like the exchange rates from local currency units (LCU) to the US dollar (USD) and the crude oil price, as well as data from non-conventional sources like the crowdsourced daily food prices, and non-conventional variables such as the sentiment index compiled from news articles collected on Twitter (Silva et al., 2024).

Food Inflation

- Food items availability and prices are key factors that affect the nutrition of a population (Silva et al., 2024).
- The informative information content embedded in news data, suggests the use of news-based sentiment indicators as an additional source of information for inflation forecasting (Pratap et al., 2022).
- Modernization of data collection and the use of web scraping techniques (Polidoro et al., 2015)
- Improvements in terms of quality deriving from web scraping for inflation measures are noticed (Polidoro et al., 2015)

Validation of food security indicators

- Rising food prices may rapidly push vulnerable populations into food insecurity (Silva et al., 2024)
- Food security availability and access indicators include several components: quantity (i.e. enough food and energy), quality, safety, and cultural acceptability and preferences. Stability is a cross-cutting dimension that refers to food being available and accessible and utilization being adequate at all times. These measures can be used to make food security statements for groups of individuals and households, as well as at higher levels of aggregation, such as community, national, or global levels (Leroy et al., 2015)
- For food security indicators, ensuring validity is challenging because of the complexity of the construct and the absence of a gold standard measure. Validation exercises should specify first which dimension or component of food security is being assessed and identify the relevant gold standard (Leroy et al., 2015)
- A substantial body of research has been done over past decades to identify, test, and validate indicators of food security access. Future research should build upon this work and focus on harmonizing indicators, setting up a global data collection system to monitor and track progress, and ensuring coordination among actors at all levels; research, practice, and policy (Leroy et al., 2015)

Sentiment analysis using text mining techniques

- In the food domain, sentiment analysis technology is widely applied to outline whether consumers' opinion is directed towards positivity or negativity. Sentiment analysis has progressed from rules-based methods to statistical machine learning and, more recently, deep learning (Xiong et al., 2024).
- Sentiment analysis algorithms are commonly employed on social media platforms to identify and analyze shifts in public sentiment, attitudes, and opinions (Ma et al., 2025).
- Even in the context of relatively stable positive sentiment, sudden spikes in negative sentiment can significantly impact the formation of public opinion. The finding underscores the necessity of real-time monitoring and a sensitive response to emotional dynamics in opinion management and food communication (Ma et al., 2025).
- Coverage of news is outlined and construction of sentiment indicators/indices using text-mining techniques is stressed (Pratap et al., 2022)

Mapping and Defining Vegetation using Machine Learning

- Machine learning can be used to predict crop yields and monitor cropland abandonment (Jarray et al., 2023).

- The remote sensing community has created several procedures for mapping and defining vegetation. They are reliant on environmental elements like soil parameters, hydrography, landform, and meteorological conditions. (Kumaran et al., 2025)
- Vegetation has been thoroughly mapped, monitored, and evaluated both qualitatively as well as quantitatively using spectral indices (Kumaran et al., 2025)
- Data features are extracted and classified using reinforcement radial Gaussian encoder with adversarial Boltzmann temporal neural networks (Kumaran et al., 2025)

In order to extract the buzzwords that characterize textmining integration within food price prediction and food security modelling, we extracted the nouns from the generated titles. Then we calculated the repetitions of each buzzword in the research papers and divided this by the total number of characters of the research papers where they appeared in (Figure3 and Figure4). The normalized repetition score reflects the priority of the buzzword and how it is a cornerstone of the research domain.

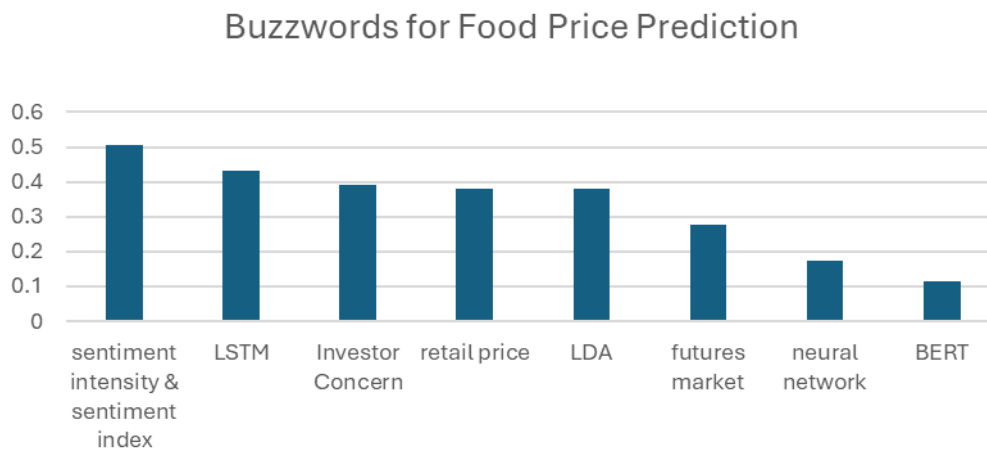


Figure3: Buzzwords for Food Price Prediction

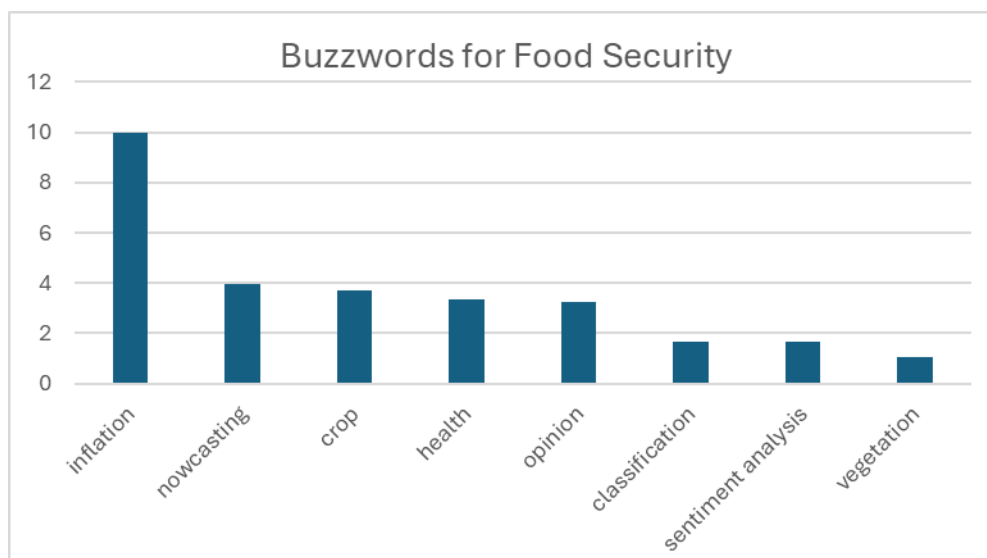


Figure4: Buzzwords for Food Security

Conclusions

The paper aims to outline research themes in the domain of integrating text-based techniques with quantitative food price forecasting and food security models. With the use of SBERT, we provided a semantic representation of the text covered in the research papers. Afterwards, we carried out clustering to achieve a homogeneous breakdown of the content based on similarity. This gave the research directions and concerns tackled in the papers. We conclude that for food price prediction sentiment analysis reflected in sentiment intensity and sentiment indexes play a pivotal role in integrating text-based techniques in quantitative forecasting models. Also, LSTM is found a common, well-proven neural network-based approach for food price prediction. Then comes LDA for topic modeling in food price forecasting, whereas BERT topic models still do not have such wide spread, although BERT has a richer semantic representation. Future work is required to compare bag-of-words LDA and BERT in topic modelling for forecasting, and compare their time performance and accuracy results. In addition, combining neural network models and integrating them with traditional forecasting models has been highlighted. This research direction is worth investigation, and we expect several research in such direction. Tackling investor concern in textmining for food price prediction is stressed in the papers, and we expect it to be a major perspective for the domain.

For food security 'Inflation' was found the major concern, as it has the highest normalized occurrence. This means it is a prime indicator to tackle food security. Therefore, we suggest research to address inflation with the advanced forecasting and text-based techniques. Similarly, nowcasting is a very important research direction in food security, and we suggest future research to address it with state-of-the-art quantitative and text-based techniques. Crop and vegetation have attracted less attention in food security. This can be interpreted as they are concerned more with the food quality rather than the contextual events that can incidentally happen within the supply chain and can cause disruptions. Again, tackling opinion of stakeholders in textmining for food security is stressed. The domain of integrating text-based techniques with quantitative models is still nascent, and with this semantic analysis we aim to conceptualize its constituents and directions.

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An inductive descriptive phenomenological analysis of the impact of change management process on employee involvement and commitment in achieving organizational goal: A study of SABMiller PLC acquisition of Voltic Ghana Limited

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Keywords

change management, corporate culture, employee commitment, employee involvement, merger and acquisition and post-merger integration

Abstract

This research conducted in 2016 prior SABMiller merged with Anheuser-Busch InBev (AB InBev), however, the findings may be useful for our modern industrial development. Post-merger Integration and for that matter change management is one of the most important aspects of merger and acquisition. However, the most vital element of change management, with respect to post-merger integration is the harmonious integration of corporate culture. Change is a major transition within organizational development, which cuts across all stages of development in organizational growth. Obvious indications exist that when trying to successfully consummate an organizational take over and the organizations involved in the merger and acquisition fail to integrate properly during the post-merger stage, a demerger results. The reasons for this difficulty in implementing successful change management during post-merger integration are due to intertwining factors, such as employee commitment and employee involvement that come to play during this stage. This phenomenology study highlights the difficulties that come with change management and the impact on commitment and involvement during the post-merger integration stage. Evidence how SABMiller Plc. integrated two different extreme cultures (formal structured corporate organization with well-established corporate governance and organization with no formal structure) are provided. This study provides alternative solution to merger and acquisition success by introducing the M-Matrix.

Introduction

Institutions such as the academic, public, and private, have long given corporate mergers and acquisition (M&A) a lot of attention (Thuy Vu Nga & Kamolrat, 2007). Roberts, Wallace, and Moles (2012) identify nine life cycle stages for M&A that fall under four main responsibilities namely pre-merger planning and development, pre-merger implementation planning, post-merger implementation planning and post-merger implementation. Broadly M&A has three main stages of planning namely preplanning and planning stage, negotiation and implementation stage, and post-merger stage. Among these stages the most difficult stage which is associated with surprises is the management of the post-merger stage (Eero, 2013; Evans, 2000). Planning and negotiating for a deal during the initial stages of M&A occurs at the top management level, mainly within the ranks of the board of directors and the executives because decisions of this nature are considered strategic to the organizations involved. According to Eero (2013), planning for acquisitions often involves only a relatively small number of people on the side of the acquiring organization, typically among members of the corporate management, while the actual post-acquisition changes involve a far greater number of people at the side of change agents and change subjects.

Change Management (CM) processes at the post-merger stage require extreme flexibility and have to be gradual (Ihitor, 2000). Scotts (2009) suggested that if some management style is not consistent with planned strategic changes, strategists might find it difficult to diversify and develop new markets where an innovative workforce will be essential. If management gets the PMI strategy implementation wrong then the outcome may be precarious, and may easily destroy a successful merger that on paper shows promise, and subsequently may affect shareholder's value.

There is a worldwide recognition that most M&A has been a total failure or total loss in shareholders' value (Banal-Estañol & Seldeslachts, 2011; Cartwright & Schoenberg, 2006; Eero, 2013). The failure of M&A is the loss of shareholders' wealth, loss of experienced managerial staff of the acquired company, or in the worse scenario demerger of the M&A. Even though there is a wide notion that the majority of M&As has failed to increase shareholders' value, statistics indications show that M&A is on the increase and therefore the need to learn lessons from successful companies may be very important (Banal-Estañol & Seldeslachts, 2011; Cartwright & Schoenberg, 2006; Eero, 2013; Lee, Kim, Kim., Kwon, & Cho, 2013). Smoothing cultural difference may increase EI and EC, thereby improving CM processes, which may result in successful M&A (Eero, 2013).

Literature Review

Overview of SABMiller Plc. Acquisition of Voltic Ghana Limited

SABMiller is an international company which was centered largely in South Africa where they had diversified interests. Established in 1895, SABMiller is one of the first breweries of South Africa currently in operations on five continents in 80 countries, brewing over 200 different beers at 139 breweries, with 75,000 employees throughout the world (Davie, 2010; URSUS, 2012). SABMiller ranked as number-two brewer in the world by sales, is second only to Belgium-headquartered Anheuser-Busch InBev. SABMiller Plc. made their presence in Ghana in 1997 with the acquisition of Accra Brewery Limited. Accra Brewery Ltd (ABL) is the oldest brewing company in West Africa.

SABMiller acquired VGL, a company, which was founded in 1995 and produces bottled water and soft drinks. VGL was then a sole proprietorship own by Pradeep Godvin who also own Bio-Plastics (The Abraaj Group, 2011). VGL has a strong presence in West Africa than any bottled water company. This made VGL the company with the largest market share in the mineral water industry in both Ghana and West Africa (Africa Business Pages, 2014). After a successful merger, both companies received a boost of capital injection into their operations; in a strategic move to ensure sustainability and maintain market leadership in both the beer and the bottled water industry targeting the huge gap in the market, which was yet to be accessed (Kapstein et al., 2011). The acquisition of VGL by SABMiller Plc. has helped VGL to maintain its market leadership and also brought efficiency in the VGL's operations.

Merger and Acquisition

Figure 1 indicates the differences between mergers and acquisitions.

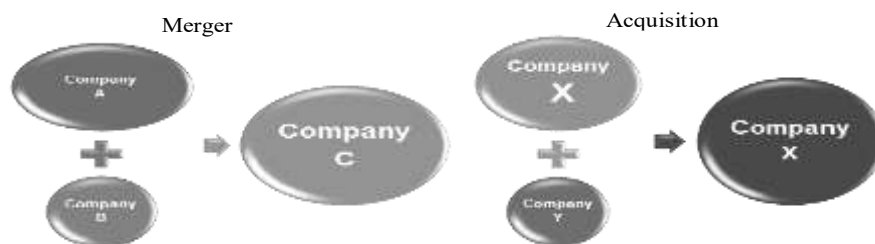


Figure 5: Differences between Mergers and Acquisitions, by (CFA, 2013)

A merger may result in a new company, while with acquisition the acquired company takes the name of the company that did the acquisition. According to Evans (2000), merger refers to the merging of two companies where one new company will continue to exist (Vazirani & Mohapatra, 2012). Acquisition refers to the acquisition of assets by one company from another company, and both companies may continue to exist (CFA 2013). There are two main classifications of M&A and these are namely hostile takeover where the targeted company's board of directors' objects to a takeover offer, and a friendly transaction is when the targeted company board of directors' endorses the merger or acquisition offer (CFA 2013).

Change Management (CM)

Prosci (2014) indicated that the three main ways to address CM are research based, Holistic and Easy to use. Holistic change provides best solution to post M&A CM because this address change issues on both individual and organizational level. The individual changes identified by Prosci (2014) are

awareness, desire, knowledge, ability and reinforcement, termed the building block for successful CM. The Awareness emphasis that the people involve must know why the change is needed (Kotter, 2007). There should be a desire from the employee being affected by the change to support and participate in the change, which is crucial and important because this would drive EC and EI. To sustain the change there is the need for reinforcement from the change sponsor or agent to the employees (Hiatt, 2006; Prosci, 2014; Rudnicka, 2011). The five-outcome competency factors of ADKAR model shown in table 2 are very important in the CM process. The individual change factors are shown in the Table 2.

Table 3: Individual Change based on the ADKAR Change Competency Model

Acronym	Milestones
A	Awareness of the need for change
D	Desire to support and participate in the change
K	Knowledge of how to change
A	Ability to launch required skills and behaviors
R	Reinforcement to sustain the change

Source: Prosci(2014)

Ackerman (1997) indicated that the three main types of CM are namely development change, transitional change and transformational change. Developmental change is the simplest type of change: This improves currently doings rather than creates something new, thus improving existing skills, processes, methods, performance standards, or conditions can all be developmental changes (Ackerman, 1997; Anderson & Ackerman, 2011). Developmental change may be either planned or emergent, enhances or corrects existing aspects of an organization, and often focusing on the improvement of a skill or process (Rudnicka, 2011). Transitional change seeks to achieve a known desired state that is different from the existing one. Transitional change is episodic, planned and second order or radical (Rudnicka, 2011). M&A can be said to be of more transitional change. Anderson and Ackerman (2011) indicated that Transitional change replaces “what is” with something completely new, and this requires designing and implementing a “new state”, requiring dismantle and emotionally let go of the old way of operating while the new state is being put into place. Transformation, however, is far more challenging for two reasons: First, the future state is unknown when implemented, and is determined through trial and error as new information is gathered, making Transformational change impossible to “manage” with pre-determined, time-bound, and linear project plans (Anderson & Ackerman, 2011). Transformational change requires a shift in assumptions made by the organization and the members (Rudnicka, 2011).

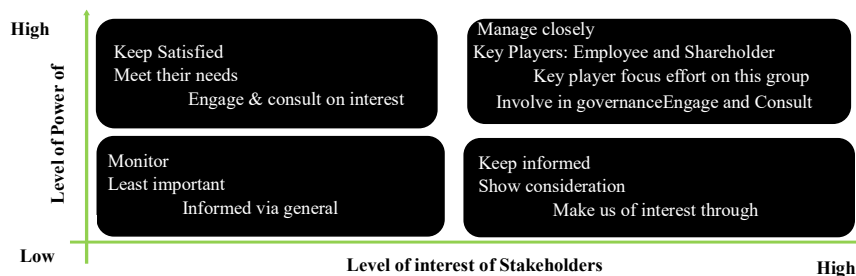


Figure 6: Stakeholder Matrix, by TOGAF (2011)

According to Schmeer (1999), stakeholder analysis is a process of systematically gathering and analyzing qualitative information to determine whose interests should be taken into account when developing and/or implementing a policy or program. In CM processes, some of the most powerful entities are the shareholders and the employees and these set of bodies have both high interest and power. However, in a majority of cases, employee factors are marginally considered during the pre-planning and planning phase (Eero, 2013). In effect, the use of stakeholder matrix helps the strategist to avoid unnecessary rift from key stakeholders like employees and shareholders in the implementation of CM.

Invariably the M&A strategist must consider the use of such tools to smoothen the cultural fit in the organization during CM processes. Most organizations, which implement M&A turn to focus more on the interest of the shareholder than the employee, because of their prime objectives is to satisfy the principal (the shareholder).

Effective communication engages the hearts and minds of all stakeholders by facilitating movement along a continuum. Figure 6 indicates the process in which communication will be effective in M&A:

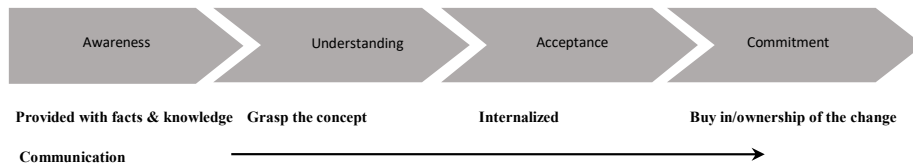


Figure 7: Communication Continuum.

Adapted from "Change management best practices guide: Five key factors common to success in managing organizational change, by Queensland Government (2014). Communication is important to a successful PMI. Accordingly, it is important that everyone in the organization and those interacting with the organization during the M&A, both internal and external stakeholders are kept informed and provided with messages and information that allow them to feel engaged and aware of the new state of the organization, thus paving the way for involvement and adoption (Queensland Government, 2014). Communication should go through the entire fabric of the targeted company ensuring that all doubt and grape vine information are blocked from the onset.

Kotter (2007) identified eight change model steps for the implementation of successfully change, and further argues that change projects fail because victory are declared too early which stale continues improvement. The use of this model may assist the M&A sponsor to evaluate the progress of the change process during PMI stage. The model steps are: Establish a sense of urgency, Form a powerful coalition, communicate the vision: "walk the talk" Remove Obstacles, Create short-term wins, Consolidate and Build on the Change, Anchor or institutionalize the change in a corporate culture.

Schein (2004) indicated that there are three stages in which a person may go through change namely unfreezing, changing, and refreezing. According to Schein (2004), throughout the process the individual may not be aware of these stages (Cawsey, Deszca, & Ingols, 2012). The unfreezing is the stage of current beliefs when shaken the individual becomes doubtful to seek alternative ways of understanding. The changing phase is where new behaviors, beliefs, and values are instilled in the target person. The refreezing phase involves fixing the new beliefs into the individuals and making it normal. At this stage the person uses these beliefs and patterns without thinking. The combination of Kotter's and Schein's models may provide better guidelines for the strategist to implement a successful PMI.

Please see Figure 4 indicating the features of change management process from pre-planning phase to post-M&A phase within M&A.

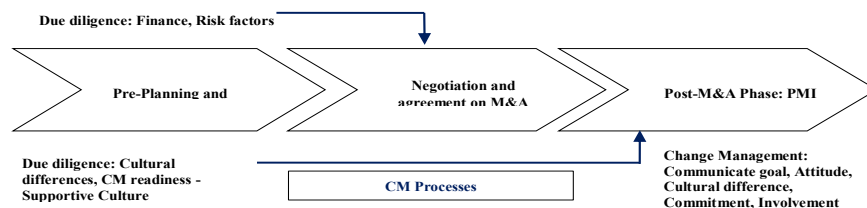


Figure 8: Change Management Processes

Figure 4 indicates the cycle of a well-planned CM Process. The pre-planning phase of M&A requires information gathering processes or due diligence from all stakeholders by the strategist before commencing planning (Scott, 2007). This due diligence includes financial risk factors and human risk factors such as cultural fit and readiness of targeted company to commit to the cultural change likely to be introduced (Supportive Culture) (Eeron, 2013; Scott, 2007; Weber et al., 2014). This information gathering must be the basis for planning. Establishing appropriate organizational structures, roles, and

responsibilities for the change that engage stakeholders to support the change effort is very important (Queensland Government, 2014). Failure to achieve this would result in the mass resignation of managers as seen with AOL-Time Warner and SABMiller Plc. -VGL.

Employee Involvement

Employee Involvement (EI) is the degree to which a person is identified psychologically with their work, decision-making or the importance of work to their total self-image (Adham, 2011; American Psychological Association, 2004; Bullock & Powell, 2011; Lodahl & Kejner, 1965). Efforts to promote job involvement among staff tend to pay off substantially since employees will be more likely to assist in furthering their company's objectives (Helper, Levine, & Bendoly, 2002). Morgan and Zeffane (2003) suggested that using EI to create mutually trusting relationships by management is a matter of strategic choice, the absence of consultation by management to initiate trust-building practice, in assumption that employees cannot be trusted to make important decisions about their work reduces the chances of employees' support or 'buy-in' for change initiatives. Similarly, this would increase the emergence of cynicism often found among workers exposed to frequent management initiatives to change (Morgan & Zeffane, 2003).

The theories of human capital, compensating differences, efficiency wage, incentives and complementarity, and conflict are very important for the strategist to understand and use to manage the human factors affecting EI. The strategist uses human capital theory to maintain high skilled employee (Almendarez, 2013; Blaug, 1976; Handel & Levine, 2006; Helper, Levine, & Bendoly, 2002). From this the M&A strategist must know the caliber of human resources in the acquired company so that remuneration is structured to ensure retention of skilled employee. Most M&A has the fundamental goal of building synergy with the acquired company that lies in the human capital in the targeted company. If this human capital is lost after M&A then the purpose of the M&A is lost from the onset, which would affect share value as seen in the merger of AT&T and NCR (Scott, 2007). There should be a fair concept to prove to employees that there is equitable wage across board to increase EI (Akerlof, 1982; Handel & Levine, 2006; Milgrom & Roberts, 1995). The concept of mutual gains between firms and employees provide high commitment because of the role of fairness conceptions in determination of expectations, effort, and wages. During the pre-planning stage of M&A, there is the need to consider the organizational structure of the targeted company. The type of organizational structure may have negative or positive influence on EI. Employees of organization with higher hierarchy are likely to have less EI than flat organizational structure. During post-M&A, the sponsor must ensure that an effective EI hierarchy of the organization is made in such a way as to generate an adequate level of involvement to attain a successful M&A. Research by Adham (2011) showed that EI can be applied positively by keeping employees informed from the beginning about changes in staffing, financial matters and new decisions such as M&A.

Group Development

Group development is essential in the development of any organization (Maslow, 1943; McLeod, (2016). Ciancutti and Steding (2001) indicated that "them-and-us" condition involves the presence of two or more adversarial or disconnected elements in team, and this is not a product of imagined maliciousness of individuals, but a natural group phenomenon in teams. The recent increase of hostile M&As can be prime conditions for "them-and-us" when these changes are not properly managed, for instance with a superordinate set of Trust Model principles, people are prone to fill the vacuum with fears of losing position, comfortable relationships or forming territory (Ciancutti, & Steding, 2001; Mullins 1985; Webster, 2014). The four main group development stages of any grouping in organization namely forming, storming, norming and performing, this was first proposed by Tuckman (Mullins, 1985; Roberts & Wallace, 2008; Tuckman, 1965). According to Tuckman (1965), a group would first go through forming stage in which the individuals in the groups come together. At the storming stage the individual team members begin to know each other better, they are able to build up a clearer picture of each person in terms of ability, commitment, skill, interpersonal skills (Roberts & Wallace, 2008). At the norming stage, group or team will develop both formal and informal standards of behavior that all members will be expected to observe. Mullins (1985), and Roberts and Wallace (2008) suggested that once the team norms

are in place, the process of actually performing begins at full capacity if the team has overcome any internal fragmentation that may have occurred in the storming process. The recognition of these stages and their functions is very important, since this shows when a group is vulnerable and needed less interruption and provide clue to managers of when the group is more formidable and can take shocks (Roberts & Wallace, 2008).

A highly motivated group may pose danger to the union especially when the leaders involved fails to manager the “them and us” factor. “Them and us” factors arise from poor performing group and there is the tendency that a high achieving team may also fall prey to this: This is normally termed as the Group Think (Ciancutti & Steding, 2001; Mullins, 1985; Roberts & Wallace, 2008). A highly committed and motivated group may work towards a set of beliefs, aims and objectives that the group shares but not consistent with the organizational goal (Mullins, 1985, Roberts & Wallace, 2008).

Employee Commitment

Nongo and Ikyanyon (2012) defined employee commitment as the degree to which an employee identifies with the organization and wants to continue actively participating in the organization. Jaros (2007) proposed that commitment is a force binding an individual to a cause of action, relevant to one or more targets. A simple definition of employee commitment is an organizational member's psychological attachment to the organization (Grimsley, 2003). Commitment exists when an individual maintains high levels of extra-role behavior in spite of low expectancy (Scholl, 2008). Commitments also reflects when an attachment and involvement with the target is shown to have greater benefit for that target than those based on concerns over social or economic costs (Meyer & Maltin, 2010) According to Singh, Gupta, and Venugopal (2008), organizations must develop a psychological bond between employees and the organization, in the form of employee commitment, in order to create total dedication of their work force towards their goals, interests, and values. Some researchers suggest employees experience three basic mindsets (affective, normative, and continuance), that affect their psychological state and is reflected by emotional ties, and perceived obligations (Colquitt, Lepine, & Wesson, 2010; Grimsley, 2003; Nieuwoudt, 2014; Meyer & Allen, 1991).

Corporate Culture

Zimmermann (2015) defined culture as the characteristics and knowledge of a particular group of people, defined by everything from language, religion, cuisine, social habits, music, and arts. Linton (1945) suggested that culture is a configuration of learned behaviors and results of behavior whose component elements are shared and transmitted by the members of a particular society. Cultural diffusion is a selective process in that whenever two cultures come into contact; each does not accept everything indiscriminately from the other (Spencer-Oatey, 2012). Thus collective value system, goals and aspiration take precedence over those of individuals. In US, individuals are responsible for their failure or success in life while in many culture in different part of the world this will be different (De Mooij, 2010). The culture differences found among different societies and ethnic groupings clearly show that organizational traits of the western part of the world may never be acceptable in certain parts of the non-western world. As indicated national culture has much influence on CC and this should not be taken lightly, thus the study of CC must not be done in isolation but within the contest of national culture (Careil, 2003).

Research Questions

1. How has the CM process impacted employees' EI and EC?
2. To what extent did CC, EC, and EI play a role in the motivation of managers participating in the SABMiller/VGL merger?

Research Methodology

In order to satisfy the need for finding frameworks, measurements, or maps to help them make sense of the chaos of the world, individuals create for themselves structures, theories, and rules (Nicholls, 2011). Phenomenology is an inductive approach and there are two main types of Phenomenology approach: Husserl's (Descriptive) and Heidegger's (Interpretive) Phenomenological Research (Reiners, 2012).

Descriptive phenomenology applies where every day conscious experiences were described while preconceived opinions are set aside or bracketed, whereas Hermeneutics Inductive approach moves beyond the description or core concepts of the experience, and seeks meanings that are embedded in everyday occurrences, and believed that bracketing is not needed because hermeneutics presumed prior understanding (Reiner, 2012).

Purposeful sampling was used because with that the researcher specifically selects individuals who can purposefully help build the understanding of the phenomenon of interest (Creswell, 2006; Patton, 2002; Sun, 2009). Snowball facilitates the identification of hard-to-find cases (Patton & Cochran, 2002). To accomplish this in this study, the first step was to identify persons who meet all the criteria set. With the aid from the first person who met the criteria set, other suggested personnel were nominated who also met the criteria. The process then continued until the entire seven participants for the interview were identified. The sample frame, which was the employee list from Human Resource, was used to identify that these selected personnel were still working with VGL and were on pay roll. Being a manager, this data from Human Resources was easier to acquire.

Data Evaluation, Analysis, and Interpretation of Results.

Seven managers from three different districts with autonomy in the management of their district within VGL were interviewed to know their lived experienced before, during, and after the M&A. The data collected during the interviewed were uploaded into software called NVivo, which helped cypher all information uploaded. The data analysis followed the stages laid down by Moustakas (1994): Horizontalizing Data, Clustering Meanings, Describing the Textures of the Experience (Triangulation), relate study to possible future research and develop an outline for a future study, relate study to personal outcomes, relate study to social meanings and relevance, and to the researcher's future direction and goals. Moustakas (1994) indicated that phenomenological data analysis should go through the stages. Participants were coded from M1 to M7. The themes were determined using the ADKAR Change Competency Model which are awareness and need for change; desire to support change, knowledge of change, ability to launch change and reinforcement of change (Prosci, 2014).

Findings

The participants indicated that the initial process of the M&A was without any prior information and so was met with resistance from old VGL management staff; "guys didn't actually understand the merger, people were not actually enlightening, so people had challenges to accepting the change". However, Human Resources introduced intense training programs for management and sales force. The participants also suggested that, "there is serious support especially from HR in terms of CM." The current state of VGL showed that employees of VGL recognized the need to change and improve on the operations of the company. The recognition was as a result of the awareness created by SABMiller through continuous training of staff at the managerial level by Human Resource. The awareness and recognition created has increase EC and EI among the member staff of VGL. The interview further showed that this awareness and knowledge created through training is cut short at the low-level employees such as the loaders and the drivers as stated by participants as "My problem is, I do not know about the lower grade worker like the loaders and those below". Nevertheless, the general knowledge among employees as to where the direction of the company and the outcome of the change is not known among the entire team. The lack of knowledge has the tendency of making member of the teams working at cross objectives that may affect the progress of the CM of the PMI stage, and also likely cause members to lose corporate branding, creating "them and us" or group think situation (Ciancutti, & Steding, 2001; Mullins, 1985).

The research indicated that leadership style has effect on employees' performance especially their commitment and involvement to job during PMI (Evans, 2000; Singer, 2005). Taking critical look of the leadership style within the corporation, which varies from autocratic, participatory and transformational it was clear that participatory and transformational leadership style was much yielding than autocratic leadership style. De Poel's (2011) indicated that participatory and transformational leadership style is source of organizational motivation. The district associated with autocratic style of leadership has the

highest level of uncertainty and agitation among employees resulting in reduction of EC and EI. District with transformational or participatory leadership style have employees contributing successful to the growth of the organization and there are high EC and EI associated with higher productivity (Kuyea, & Sulaimonb, 2011). The study further revealed that EC and EI are influenced by leadership style either negatively or positively having direct consequences on team behavior and group development across the organization (Queensland Government, 2014). Some managers within the team recognized the fact that there were different styles of leadership prevailing at different districts. This was asserted in the interview by participants indicating that: "I can say that my style of managing my people is different from what I can see anywhere among my colleagues". To further explain the findings, the table below indicates the degree or level at which themes play a role in CM during the PMI stage. Table 3 indicates the general findings in a tabular form.

Table 4: Themes and factors affecting PMI processes

Themes/Factors	District I (M1, M2, M3, & M4)	District II (M5 and M6)	District III (M7)
The recognition of cultural changes	Very High	Very High	Very High
Awareness	Very High	Very High	Very High
Awareness Factor	Training	Training	Training
Knowledge of Change	No	No	No
Commitment to the change	Low	Very High	Very High
Support for the change	Low	Very High	Very High
Impact of groupings on support for CM	Positive & Negative	Positive	Positive
Impact of groupings on support for change	Positive & Negative	Positive	Positive
Group Development Stage	Storming	Performing	Performing
Leadership Style	Autocratic	Transformational/ Participatory	Transformational/ Participatory
Impact of change management on EC and EI	Negative	Positive	Positive

The table indicates that there may be consensus among participants that support from SABMiller for the change has been enormous on the side of management, in terms of provision of training and general tools for operation. This support provided by SABMiller has really equipped management staff to carry on with their day-to-day activities materializing in tremendous growth of the company. Nevertheless, there is also agreement that the lower ranks of employees may not have such support, as did the management team.

The table further indicates that management of various districts adopted different leadership style, which may have had direct influence on employees' commitment, involvement and demands on the company. Districts with autocratic leadership style may have employees demanding from management higher incentives, more motivation and improve working conditions. Those with leadership style of transformational or participatory has employees being highly committed, involved, motivated and demanding more interactions with management. The result also indicated the strong presence of grouping within VGL, with group development stages varying from district to district ranging from storming to performing stage. During the study, district with participatory and transformational leadership style provided more cohesion among employees which resulted in higher EC and EI. This was

more prevailing in District II and III. Yet, in District I with autocratic leadership style saw more of employees' cynicism and agitation. The absence of consultation by management to initiate trust-building practice a usually characteristics of autocratic leadership style, reduces the chances of employees support for change initiatives, increase the emergence of cynicism often found among workers exposed to frequent management initiatives to change as suggested by Morgan and Zeffane, (2003). Autocratic leadership style reduces employee's commitment and involvement in achieving corporate goal and may result in high employee turnover during the PMI stage (Colquitt et al., 2010).

Discussion of the Results

Please see Figure 7 demonstrating the effect of management styles on employees' commitments and the effect on successful change as derived from the research: The M simply means Mensah. M model is the researcher's model or concept for PMI path way needed to be considered by strategist during the initial stages of M&A.

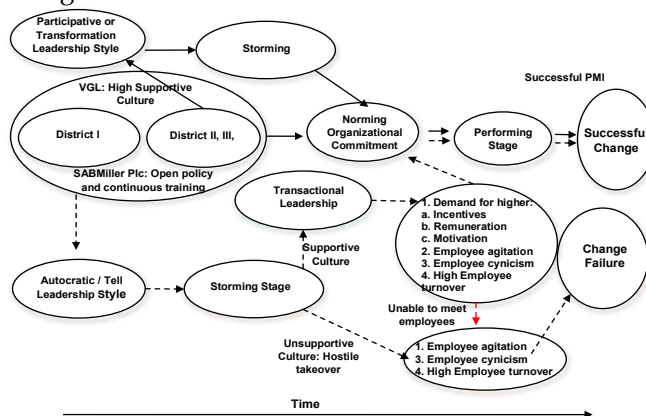


Figure 9: M-Model Base on the research indicating that type of leadership has direct influence on employee's commitment.

The model help determining the type of leadership style required for successful PMI based on the level of the change subject's supportive culture being either low or high. Supportive culture is the level of EI and EC toward the achievement of organizational goals. The model indicates two pathways autocratic leadership style (black broken arrowed line) and transformational or participatory leadership style (black continuous arrowed line). The red broken arrow line indicates the situation where there was standoff by employees or when employees' demands at the storming stage were not met in areas where leadership style is autocratic. The M-model shows that the employees of VGL may have supportive culture before the acquisition. This culture was further strengthened and supported by continuous training and open policies of SABMiller.

In District II and III where management leadership style was transformational and participatory the model indicates that the group takes a shorter time to get to performing stage thereby creating successful change and PMI. Nevertheless, in District I where managers adopted autocratic style of leadership during PMI stage may have led to some resistance from employees and also delayed the group development stage leaving the group at the storming stage since the merger between SABMiller Plc. and VGL.

During the storming stage employees from District I, became more transactional. The attitude portrayed by this employees of District I was constant psychological contract with management in the form of increase incentives, remuneration and motivation in order to be committed and involved in the cause of the organization with combination agitation and cynicism from employee, with high employee turnover in District I. Such a team may remain at the storming stage for a very longer period to get through to norming then to performing stage.

The model can further be explained in a matrix form indicating the PMI probability with regards to leadership style of the change agent and the supportive culture from the acquired company or change subject as indicated in Figure 12: The matrix indicates the combinations that the strategist is likely to meet or undertake during every PMI stage with each quadrant representing a mixture of leadership style of the

change agent and the supportive culture of the change subject. The arrows indicate the likely movement of the change subject in support to organizational goal depending on the prevailing conditions.

PMI Probability for Leadership Style	High	Participatory / Transformational Quadrant A: Dreamer High/Low: PMI Successful: Characteristics: Gradual Increase in support from change subject, and reduction in Psychological tremor with occasional demands from employees.	Quadrant B: Dove High/High: PMI Successful: Characteristics: Total Support from Acquired company leads to shorter time frame in PMI success (District II and III)
	Low	Autocratic Leadership Quadrant C: Snakes Low/low: PMI Failure: Characteristics: High employee turnover, cynicism from employee Initial. Low Supportive Culture stay permanently	Quadrant D: Question Mark/Limbo Low / High: Demerger / PMI Success: Characteristics: Increase in Psychological tremor. Reduction of support of Change Subject with Psychological contract from employee; more transactional i.e. Increase in incentives, Higher remunerations, More improve conditions, cynicism, High Employee turnover (District I)
		Low Supportive	High Supportive
		Low	High
PMI Probability for Supportive Culture			

Figure 13. M-Matrix based on M-Model;

The four quadrants are: Quadrant A-Dreamer, Quadrant B-Dove, Quadrant C-Snakes and Quadrant D-Question Mark/Limbo. The model indicates that low PMI Probability is associated with the combination of autocratic leadership of the change agent with low supportive culture from the change subject and this represents Snakes' Quadrant. The Snakes Quadrant may have very high probability of PMI failure. A typical example is AT&T and NCR: AT&T imposed their culture on NCR, which was a typical approach of autocratic leadership style, and was rejected by NCR, which who also had low supportive culture for the acquisition (Scott, 2007). IBM sale of ROLM to a German company Siemens, which was a result on imposition of IBM policies on ROLM. High PMI probability is associated with the combination of transformational/ participatory Leadership from the change agent and high supportive culture from the change subject and this represent the Dove Quadrant. Example of Dove quadrant is Districts II and III of VGL, which has very high potential likelihood of PMI being successful.

The research also indicated that there could be movement between the quadrants such as moving from Dove to Dreamer and from Question Mark/Limbo to Snakes quadrants or vice-versa. This became evident in the research indicate that VGL had high supportive culture from the onset, however this was reduced after the M&A due to the lack of communication of the M&A by SABMiller, with misgivings from some participants that it was shrouded in secrecy. This accounted for the resignation of many senior managers at the initial stages of the M&A and resulted in districts II and III moving temporarily from Dove to Dreamer Quadrant, and District I moving to the Snake quadrant instead of the Question Mark/Limbo Quadrant. One must understand this imposition of SABMiller on management staff of VGL was a typical style of authoritarian leadership style from SABMiller.

However, Human Resources intensive training for the whole team reversed the trend of the group, bringing District II and III back to Dove and District I to Question Mark. For high supportive culture combine with all types of leadership style communication is the catalyst for movement between the quadrants. As indicated in the chronicle, most M&A which showed high possibility of success and there was culture imposition end up breaking up even though there were good initial communication. The research conducted by Guest, and Peccei, and Thomas (1993) further indicated that communication can do very little in trying to resolve issues of EI/EC, and so the strategist must be very thoughtful in buying organization with low participative culture.

The negative impact of the autocratic leadership style of management of District I has had minimum impact on the entire operations of the team of VGL, because the District forms just a fraction of the entire team and so the impact on total PMI is not seriously felt throughout the organization: This result would

have been different if the operations of the various districts were similar to District I. Another important revelation that this research brought out was that, as demerger or M&A failure are normally associated with M&A with culture fit issues, such as SABMiller Plc and VGL, was not in the case of SABMiller acquisition of VGL. However, the research reveals that if the change subject and the change agent have high supportive culture and the change agent adopts either transformational or participatory leadership style the problems associated with cultural difference would be overcome there by increasing the chances of successful M&A.

Limitations and direction for future research

In this study, the limited experiences of the researcher in phenomenological studies cannot be ignored. Another limitation is the limited resources available; mainly because the research was self-sponsored the study could not address all issues related to CM. The close relation of the researcher with the interviewee and to ensure that the corporate image of the company is protected is paramount. The generalization of the research may not be possible because the finding is limited to one corporate body, SABMiller. Within the said corporate body, the attention focuses on three districts of VGL among the numerous subsidiaries across the five continents. Despite these limitations, the present study makes several important contributions providing a body of knowledge for future studies.

The present study suggests that during M&A there is the need to involve Human Resource managers and directors spear heading training of employees of the targeted company. There is also the need to consider the right change agent with the right leadership characteristics and character to spear head the CM during PMI. A company with high supportive culture may likely be committed to any changes as indicated in this study. Leadership style may have serious consequence on PMI, commitment, involvement and group development irrespective of how strong the supportive culture of the acquired company may be. There is also the need to recognize the impact of national culture on businesses especially locally owned businesses as ascribed in the research as the “family thing”. Communication must be continuous processes not limited to a few selected people as did in SABMiller acquisition of VGL, the absence of this may reduce high supportive culture. There should be transparency and information flow must be forth coming from top management to the shop floor member to prevent grape vine activities settling in. The study further suggests that during PMI stage, management must consciously adopt transformational and participatory leadership style to help quicken maturity of PMI stage. The research further suggested that there is the need for the acquiring company to draw up a SMART (Specific, Measurable, Achievable, Relevant, and Time-bound) form of theme, policies, or goals that would be pursued during the PMI period to direct the activities of the employees to a common goal. The objectives must clearly indicate what the whole set up should be like within the period of integration. There is the need for the acquiring company, if multinational, to consciously reduce the hierarchical chain by empowering middle managers during the PMI stage. National culture must be considered since this may have a bearing on the organization procured. Regardless of the important advances brought by this study, a lot of work remains to be done to understand the effect of CM and leadership style on EC and EI during PMI. In addition, there is the need for further application of the M matrix in a real situation to further prove the application of the M matrix.

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Food security under climatic perturbation: insight from Punjab, Pakistan

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Keywords

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Abstract

Food is one of the basic necessities and inevitable for humans' survival. Provision of food to everyone is one of the basic agendas of The United Nations (UN). The Food and Agriculture Organization (FAO) is working in almost all over the world and trying to make the nations "hunger free" with special focus on developing countries. Pakistan is also struggling to achieve the "Zero Hunger Goal" and several initiatives have been taken in the past and are continued by the sitting government. Climatic changings have posed serious threat to food security in recent years. Rise in temperature, flood, drought and water scarcity are some of the major challenges and threats to food security. The present study is conducted to investigate the impact of climate change on food crop (wheat). Both primary and secondary data is used to analyze the results. The district of Punjab which is producing wheat crop at large is selected and then data is collected for wheat production and other variables. Production of wheat crop is taken as an independent variable while water availability, temperature and rainfall anomalies are taken as an independent variables. Multiple Linear Regression Model (MLRM) is used to interpret the result. The results show that water availability has positive impact on food production while rise in temperature has negative impact. Co-efficient of rainfall showed that it has positive but weaker impact. Study is helpful for economists, scholars, government officials and policy makers who are in unremitting scuffle to achieve the zero hunger goal.

Introduction

Food security is considered a universal human right and a key to sustainable development. Food security is defined as the right to have access to safe, sufficient healthy food that meets dietary needs and preferences for an active and healthy life (Food and Agriculture Organization [FAO], 2022). 'Zero Hunger' is one of the Sustainable Development Goals (SDGs), a 2030 Agenda for Sustainable Development initiated by the United Nations which aims to end hunger, achieve food security, improve nutrition and promote sustainable agriculture (United Nations, 2020). But in developing countries like Pakistan food insecurity has become a major issue and it becoming worse due to economic fluctuations and harsh weather patterns.

Pakistan is known as an agricultural economy and most of its population depends upon agriculture for their subsistence. Food crops such as Wheat contributes a high share to national food security and Punjab is the largest wheat producer province of the country (Pakistan Bureau of Statistics, 2021). But the agricultural output of Punjab is under continuous threat because of the changing weather pattern. For several decades, increasing temperatures, occurrence of extreme weather conditions, such as floods and droughts, and erratic rainfall patterns have escalated in frequency and intensity, presenting immense challenges to crop production. Furthermore water availability is declining which increasing the severity of food insecurity in the country (Hussain et al., 2020). These climatic disturbances have severe consequences not only to food security but to the people who depends upon agriculture for their livelihood.

Climate change is identified as a leading driver of global food insecurity, which has the potential to impact food production, food supply chains and food access (Lobell et al., 2021). The impacts of climate change on food security are multidimensional, including temperature changes, the alteration of precipitation patterns and the availability of water supplies. These changes are especially precarious in

Pakistan as most of the agrarian areas depends upon ground water and canal water for crop production (Amin et al., 2020). In addition, increase in occurrence and severity of extreme weather events, including 2010 and 2022 catastrophic floods have disrupted agricultural practices, displaced populations and devastated critical infrastructure (Abid et al., 2021).

A key cereal crop, wheat is the staple food of millions of Pakistanis and is highly vulnerable to climatic variations. This is a winter season crop and it relies on the favourable temperature and water supply for its growth. In Punjab, the temperature is harsh i.e., very hot and extreme cold which affects the flowering and grain filling and hence decrease the yield of wheat (Raza et al., 2023). Additionally, the erratic rainfall has resulted in water scarcity which further effects irrigation patterns and time of wheat sowing and harvesting (Javed et al., 2020). In Pakistan, wheat is essential for food security as it is the main food of most of the population (Shah et al., 2021). But climatic changings have badly effected its production in the country.

Punjab's contribution to combating food insecurity has been substantial for decades, however its susceptibility to climatic variations is also increasing. Resultant to the situation of climate change, agro-ecological settings are being transformed with the need for immediate adaptation mechanisms for sustainable food production (Arif et al., 2022). Although a number of mitigation options exists as introduction of drought resistant crop varieties, water efficient irrigation, and better water management; agriculture in the region still has a risk of reduced yield in response to climate variability (Rizwan et al., 2022). In addition to that socio-economic circumstances some other factors like poverty, limited availability of agro-technologies and knowledge among the farmers about climate change situation make it even more difficult for the farming community of Punjab to keep themselves up to date with modern farming practices (Murtaza et al., 2021).

The Pakistani government and some international organizations have introduced several measures to improve food security and agricultural productivity which include improvement in efficiency of irrigation water, quality seeds and promotion of climate-smart agriculture technology (FAO, 2020). Despite of these efforts there is still large void in addressing all-dimensions of impact of climate change on food security, especially in the wheat growing Punjab province. Knowledge of climate variables like temperature anomalies, precipitation patterns, and water availability and its impact on wheat production in the region is also of great importance for formulating locally-informed policies to ensure food security (Khan et al., 2023).

This paper attempts to explore linkage between climate change and food security, especially wheat production in Punjab Pakistan. This research aims at contributing to the understanding the vulnerabilities of Punjab's winter wheat production to climate perturbations and policy implications for reducing the impact of climate change on food security. This study provides valuable information for policy makers, agriculture planners and climate adaptation authorities for enhanced food security and sustainability amidst continued climate challenges in Pakistan.

Methodology

Study Area

Punjab is the leading agricultural province in Pakistan and this study was performed in Punjab. The province is a major wheat producer which makes it a suitable region to study the impact of climate change on food security. The "Multan" is the major district in Punjab for wheat production which consists of four tehsils namely Multan City, Multan Saddar, Jalapur Pirwala and Shujaabad. First two tehsils are rural and urban while last two (Jalapur Pirwala and Shujaabad) are rural tehsils. Wheat is mostly produced and grown in rural tehsils therefore these are selected as study areas. Total 150 farmers (75 farmers from each tehsil) who were growing wheat crop were randomly selected to obtain the data for the study.

Data Collection

Both primary and secondary data was collected. A structured questionnaire was designed to collect data on wheat production, irrigation and challenges related to climate was administered to the local farmers for obtaining the primary data. Secondary data was collected from government and

meteorological organizations like Pakistan Meteorological Department and Punjab Agriculture Department for other variables temperature and rainfall.

Primary Data

A sample of 150 wheat growing farmers was drawn from the study area to collect the primary data. A standardized questionnaire was prepared and presented to the farmers. Questions of the questionnaire covered:

- Wheat yield per hectare
- Method of irrigation and frequency of irrigation
- Apparent shifts in temperatures and precipitation patterns
- Adverse effects of climate conditions on crop productions

Farmers were also asked to share historical production data of wheat for five years, so that trends could be studied and the impact of altered weather conditions on production could be assessed.

Secondary Data

Weather which include temperature, rainfall and water quantity, was drawn from other sources as secondary data. The data source was as follows:

- The Pakistan Meteorological Department (PMD) for past weather data such as temperature and rainfall deviations.
- The Punjab Agriculture Department, for information on irrigation patterns and water shortages in the area.

The long-term (for the last 20 years) records of temperature and rainfall were obtained from these data sources and average data is used for analysis. Such records were necessary to get the climatic change information that could affect the production of wheat.

Variables

In the estimation, wheat production yield can be taken as a dependent variable, that is, tons/hector. The independent variables included:

- Temperature: The mean temperature of the wheat growing season (October to April), in Celsius.
- Rainfall: Amount of total rainfall during the wheat growing period in mm.
- Water Availability: Based on water availability for irrigation during the crop cycle. (Dummy variable is used for analysis, 0 if water is not available and 1 if water is available)

These variables were selected as they have been reported previously for having direct impacts on crop yield (Raza et al., 2023; Amin et al., 2020).

Model Specification

A multiple linear regression model (MLRM) was used to assess the correlation of climatic variables with wheat productivity. The model was intended to determine the effect of temperature, rain fall and water availability on wheat-yield for the chosen districts of Punjab. The following equation was used:

Where:

- Production of wheat is the dependent variable (wheat yield in tons per hectare).
- Temperature, Rainfall and Water Availability are independent variables.
- β_0 is the constant term.
- $\beta_1, \beta_2, \beta_3$: are the coefficients of the each independent variables.
- ε represents the error term.

This model helped to assess the magnitude and sign of association of each independent variable with wheat production. The regression analysis was conducted and result interpretation was made using statistical softwares SPSS and STATA.

Data Analysis

For statistical analysis, regression model was used to analyse the data derived from primary and secondary sources. Descriptive statistics was used to get an idea about over-all situation of wheat yield under climatic changings in study area. Then we carried out the correlation analysis to analyse the relationship between the climatic factors and wheat yield.

The Multiple Linear Regression (MLR) model was used to estimate the effect of changes in temperature, rainfall and water availability on wheat yield. $P < 0.05$ was considered to be statistically significant in the regression analysis. This enable the researchers to detect statistically significant associations between climatic factors and wheat production in Punjab.

Limitations

There were some limitations. First, the reliability of primary data was based on the memory of farmers about past crop production and climate conditions and could potentially be biased. Second, the secondary data on water stock relied mainly on existing historical records and all types of water shocks such as depletion of groundwater, and water quality could not be considered. Nonetheless, in spite of these limitations, the study achieved insights into the influence of climate change on wheat crop yield which could help in mitigating the climatic effects on wheat production in Punjab.

Ethical Considerations

The study followed ethical principles in gathering information. All participating farmers gave their informed consent that they are aware of the purpose of the study and that their participation is voluntarily.

Results

The analysis of the data collected from both primary and secondary sources revealed several key findings regarding the impact of climatic variables i.e. temperature, rainfall, and water availability on wheat production in Punjab, Pakistan.

Descriptive Statistics

Before delving into the regression analysis, we first present the descriptive statistics for the primary and secondary data collected. The data was gathered from 150 wheat farmers across the selected districts in Punjab: Faisalabad, Multan, and Bahawalpur. The descriptive statistics for wheat yield, temperature, rainfall, and water availability are summarized below:

Variable	Mean	Standard Deviation	Min	Max
Wheat Yield (tons/hectare)	2.80	0.92	1.20	4.50
Temperature (°C)	21.50	1.56	18.30	25.00
Rainfall (mm)	115.30	34.80	50.00	200.00
Water Availability (during irrigation)	4.20	1.32	2	7

Correlation Analysis

A correlation analysis was conducted to examine the strength and direction of the relationship between the dependent variable (wheat yield) and the independent variables (temperature, rainfall, and water availability). The correlation matrix is shown below:

Variable	Wheat Yield	Temperature	Rainfall	Water Availability
Wheat Yield	1.00	-0.68	0.25	0.74
Temperature	-0.68	1.00	0.15	-0.60
Rainfall	0.25	-0.15	1.00	0.30
Water	0.74	-0.60	0.30	1.00

Variable	Wheat Yield	Temperature	Rainfall	Water Availability
Availability			0	

From the table, we observe the following:

- There is a **strong negative correlation** between temperature and wheat yield ($r = -0.68$), indicating that as the temperature increases, wheat yield tends to decrease.
- **Water availability** shows a **strong positive correlation** with wheat yield ($r = 0.74$), highlighting the importance of adequate irrigation in boosting wheat production.
- The relationship between rainfall and wheat yield is **positive but weak** ($r = 0.25$), suggesting that rainfall alone may not be sufficient to sustain wheat production in the region, and its effect may be influenced by other factors such as timing and distribution.

Regression Analysis

The results of the MLRM analysis are presented in the following table. The regression equation was used to assess the relationship between the dependent variable (wheat yield) and the independent variables (temperature, rainfall, and water availability).

Variable	Coefficient (β)	Standard Error	t-Statistic	p-Value
Constant (β_0)	5.20	0.30	17.33	0.000***
Temperature (β_1)	-0.420	0.12	-3.72	0.001***
Rainfall (β_2)	0.148	0.09	1.64	0.105
Water Availability (β_3)	0.390	0.10	4.11	0.000***

Interpretation of Results

The regression analysis reveals the following insights:

1. **Temperature:** The coefficient for temperature is **-0.420**, which indicates that for every increase in 1°C in temperature, wheat yield is expected to decrease by 0.42 percent tons per hectare. The t-statistic of **-3.72** and the associated p-value of **0.001** suggest that the relationship between temperature and wheat yield is statistically significant at the 1% level.
2. **Rainfall:** The coefficient for rainfall is **0.148**, meaning that an increase in rainfall by 1 mm during the wheat growing season is expected to increase wheat yield by 0.148 percent tons per hectare. However, the p-value of **0.105** indicates that this relationship is not statistically significant at the 5% level. This suggests that while rainfall has a positive effect on wheat yield, it is not as influential as temperature or water availability.
3. **Water Availability:** The coefficient for water availability is **0.390**, means that availability of water during irrigation of wheat will increases yield by 0.39 percent tons per hectare. The t-statistic of **4.11** and the p-value of **0.000** indicate that the effect of water availability on wheat yield is statistically significant at the 1% level. This highlights the importance of adequate irrigation in sustaining wheat production, especially under the challenges posed by climate change.

Discussion

The results of the present study depict that temperature and water supply deeply influence wheat production in Punjab, Pakistan. The findings indicate that temperature has a negative impact on wheat productivity as significant negative relationship has been observed between increasing temperatures and decreasing yield. This is in line with other studies, which highlight wheat's temperature sensitivity, especially in heat stress conditions during flowering and grain filling periods (Lobell et al., 2021). The

temperature coefficient of our analysis implies that for every degree increase in temperature, results in about 0.42 percent ton/hectare reduction in wheat yield, which is in line with studies on the negative effects of increasing temperature on crops yield globally (Shah et al., 2021). This temperature sensitivity is undermining the food security in areas such as Punjab which depend heavily on wheat as a staple crop.

The effect of rainfall on wheat yield was positive but lower and not statistically significant at the 5 percent level. This indicates that wheat yield is affected positively by rainfall, but it is less crucial compared with hot temperature and unavailability of water. These results are indicative of the intricate rain spells of Punjab (Javed et al., 2020). Indeed, the erratic distribution of rainfall and the mismatch between rainfall pattern and water demand of the crops often tend to aggravate water scarcity problems which adversely affect the yields (Abid et al., 2021). This emphasizes the need of managing natural and artificial water resources for improving crop yield in the areas.

However, the results show the importance of water availability for wheat production. In the presence of unpredictable rainfall and limited water resources due to climate change, the positive relationship between water availability and wheat yield highlights the need for better irrigation systems (Raza et al., 2023). The value of the water availability coefficient found in this study suggests that for each additional irrigation cycle (water availability during irrigation) leads to rise in yield by 0.39 percent tons/hectar. It also strengthens the notion that water management is a critical factor for the sustainability of agricultural productivity in Punjab. The result corresponds to the findings of the previous studies that irrigation is indispensable to combat the effects of climatic stress (drought and erratic rainfall) particularly in the arid and semi-arid agro-ecological zone (Hussain et al 2020). Hence, enhancing irrigation facilities, such as the promotion of water-saving techniques including drip irrigation can lead to stable wheat yield in the areas.

Conclusion and Suggestions

The findings of the present study reveal that temperature and water availability are key factors for the wheat production in Punjab, Pakistan. The results suggest that increase in temperature as a result of climate change is a major threat to wheat yield and actions are needed to prevent or at least mitigate these impacts. Availability of water, especially by optimising irrigation is also a major challenge in order to sustain wheat production under climatic stresses such as drought, erratic rains etc. Numbers for rainfall were positive too but not as strong as temperature and water availability which indicates that reliance on natural rainfall is insufficient for achieving food security.

The findings of this research have important policy implications for food security in Pakistan. The adverse impacts of temperature on wheat with the importance of water availability suggest that climate change poses serious threats to agricultural production and food security in the area (Amin et al., 2020). Based on findings some policy options such as investment in improving irrigation infrastructure, development of heat tolerance wheat varieties and adoption of good water management practices are suggested to reduce the effect of climate variability on wheat production and achieving food security in the long run.

In light of these results, it is suggested that improving irrigation systems, use of heat-tolerant wheat varieties, and improving water management procedures are indispensable measures for sustaining wheat production and food security in the region. Policy makers should concentrate on climate change adaptation practices to mitigate the adverse effects of climatic changes. In addition, promoting climate-smart agriculture practices and building farmers 'capacity for adaptation to climate change will be crucial to maintain sustainable food security. The findings of the study are the crucial first step toward understanding the intricate linkages between climate change and food production which can culminate in the formulation and implementation of appropriate policies to counter the looming threat of food insecurity in Pakistan.

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An insight into the perception, attitude and purchase behaviour of Indian consumers towards organic products and its implications for sustainability

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Keywords

Consumer perception, India, Organic food, Organic products, Purchase behaviour

Abstract

Ever since the concept of organic food got popular in the country, India has emerged as one of the largest markets in the world for organic food. The organic foods or products are healthy, do not contain chemicals or preservatives, are totally natural and much better than any form of non-organic food. Organic food is a product which is made without any help or any kind of pesticides, herbicides or insecticides. Since the organic food offers more health benefits than the conventional food, the Indian government is leading from the front to ensure multi-fold growth in organic market. This paper studies the consumer perception and attitude towards organic food purchase, their level of awareness regarding organic food and explores the factors that influence the organic food purchase behaviour of consumers. 100 samples were collected using non-probability convenience sampling method and same were used for data analysis. The results of data analysis show that increasing health consciousness, taste/preferences, product quality, and environmental concerns are major factors influencing the purchase of organic food in India. On the other hand, high prices, lack of awareness, authenticity issues, resources required for growing the organic food are some of the major challenges that come in the way of organic food.

Introduction

Over the past decade, consumption patterns of consumer has changed drastically. This change is more visible in food consumption as the consumers want to eat organic food because of their perception of organic food being healthy and grown with use of organic manual and other natural resources.

Organic food excludes all the external materials added to traditional food which tends to be toxic in nature. If one practices eating organically produced foods, one is guaranteed to have better and healthier diet to sustain the human body. Consumption of organic foods also reduces the risk of getting cancer. These foods are 90% safer in the sense that human waste or animal excretions are not being incorporated in the production. In traditional foods, it is believed that the water supplies have a percentage of human waste and animal excretions present. Organic foods support the environment friendly causes in that it doesn't allow the secretion of harmful materials into the atmosphere and ultimately the environment. Pesticides and herbicides used in traditionally produced foods are harmful to the environment especially to aquatic organisms. Therefore, organic foods encourage the cause to make the environment a safer place to live and help in improving the environment. These foods don't result in the emission of greenhouse gases which affect the atmospheric conditions.

Organic agriculture is done with an objective to produce healthy and quality foods without using any synthetic chemical products. Thus, organic agriculture does not only preserve the environment but it also improves public health by bringing significant benefits both to the economy as well as to the social cohesion of rural areas. The interest of consumers and public institutions towards organically produced foods has increased over time mainly in developed countries. Main concern of consumers in respect of organic foods is about food safety, human health and the environment.

Globalisation of organic food and its culture are the core factors for future popularisation. Main motivation for these organic foods is fast growing health markets. Retail outlet culture is now growing rapidly in India. Shelf life of these foods are minimum of 2-3 months. Quality, taste and flavour of these foods remain as good as conventional foods.

Organic farming provides long-term benefits to people and the environment. Organic farming aims to increase long-term soil fertility, control pests and diseases without harming the environment, ensure that water stays clean and safe, use resources which the farmer already has so that the farmer needs less money to buy farm inputs. Organic farming also emphasizes at producing nutritious food, feed for animals and high-quality crops to sell at a good price. Organic farming works in harmony with nature rather than against it. This involves using better farming techniques to achieve good crop yields without harming the natural environment or the people who live and work in it. Organic farming does not mean travelling 'back' to traditional methods. Many of the farming methods used in the past are still effective even today. Organic farming takes the best of these and combines them with modern scientific knowledge. Organic farmers do not leave their farms to be taken over by nature; they use all the knowledge, techniques and materials available to work with nature. In this way the farmer creates a healthy balance between nature and farming, where crops and animals can grow and thrive. To be a successful organic farmer, the farmer must not see every insect as a pest, every plant out of place as a weed and the solution to every problem in an artificial chemical spray. The aim is not to eradicate all pests and weeds, but to keep them down to an acceptable level and make the most of the benefits that they may provide.

Literature Review

The term 'organic' refers to the way in which agricultural products are grown and processed across the globe. Organic foods refer to those food products which are produced without using pesticides and chemical fertilizers (Allen and Alabala, 2007). Consumers perceive these foods as environment-friendly as these are produced without using pesticides and fertilizers or chemicals and comply with animal welfare standards (Darnhofer and Lindenthal, 2009). They are grown in safe soil, which have no modifications, and must remain separate from conventional products. Farmers are not allowed to use synthetic pesticides, bio-engineered genes, Genetically Modified Organism (GMO), petroleum-based fertilizers, and sewage sludge-based fertilizers.

Sustainable products always looked as the expensive option (Market & Opinion Research International Limited (MORI), 2003). Being environmentally friendly is considered to be accessible only to the middle classes. The consumers want to have options among the sustainable products rather than choosing products that are sustainable and that are not. Consumers collect and arrange information about product attributes and consequences to evaluate a product and make choices of their own. They depend on their involvement felt which is influenced by their experience. The importance placed on each parameter is based on the consumers' priorities and values. Experience develops personal relevance, importance, interest which together concludes the motivational state (Shroeder, 2003).

Generally, organic food avoids or neglects pesticides or synthetic fertilisers. Presumably organic food contains very fewer chemical residues and veterinary drugs as compared to conventional food. Environmental contaminants, however, are likely to be found in food of both organic and conventional productions. Organic food contains only one- third of pesticides as that of conventional food does (Baker *et al.*, 2002). It can be stated that lower exposure translates into lower risk. In conventional food, almost all produce will have pesticide leftover below the statutory maximum limits. Consumers are inclined to buy organic food products as they are environment-friendly and health-conscious (Tregear *et al.*, 1994; Davis *et al.*, 1995; and Fotopoulos and Krystallis, 2002a, 2002b) and have safety and quality concerns (Zotos *et al.*, 1999; and, Chryssohoidis, 2000a and 2000b) also have nutritional value, taste, freshness, and price (Zanoli, 1998; Zotos *et al.*, 1999; and Chryssohoidis, 2000a and 2000b).

Some studies also reveal a variety of other purchase motives that seem to reflect national interests such as 'support to organic farmers' for German consumers (Worner and Meier, 1999) or 'animal welfare' for British consumers (Meier and Woodward, 1999). However, there are some consumers who are not willing to buy these foods even with high income in their hand due to lack of some special value in the

eyes of the consumers (Tregear et al., 1994; and Roddy et al., 1996) and doubts about product guarantees or certification (Worner and Meier, 1999). Pujari and Wright (1996) in their study mentioned the 1990s as the 'the decade of environment' due to emerging environmentalism issues facing business and the public. Organic foods are produced without using chemical fertilizers and pesticides and thus reduce pollution (air, water, soil), conserve water, reduce soil erosion, increase soil fertility and use less energy. Environmental care is considered as one of the main motivational factors towards purchasing any product including organic products.

Several studies have shown that organic production causes less harm to the environment as compared to the conventional products. Consumers are getting more environmental conscious and willing to contribute to protect the environment via any or various means. Ling (2013) evaluated consumers' purchase intention of green products with an aim to examine drivers and its moderating variable that influence purchase intention. Previous research studies have also mentioned that consumers are willing to pay a premium price for the food product if it is justified by true value of the product (Rao and Bergen, 1992; and Tse, 2001). Consumers are inclined towards organic foods because of their environmental and health concerns (Smed and Jensen, 2003; and Fu et al., 1999). However, Laroche et al. (2001) argue that consumers have favourable attitude towards green products but there is limited information as to how much consumers are willing to sacrifice for such products.

With the increase in income, people prefer more of healthy and hygienic food which has led to an increase in the demand for organic food products (Corsi and Novelli, 2003). Generally, organic consumer is little less price sensitive and is more concern over quality. Ozguven (2012) figured out the motivation factors of consumers to buy organic food products. Most of the respondent consumers preferred organic milk, fruit and vegetables in the organic food category. The results indicated that quality and price were more explanatory factors. Price and quality were found to have more significant relationship as compared to other factors. Thorgosen et al. (2015) examined the factors influencing organic food consumption in the Chinese market. The paper stated on the findings of the study into consumer perception toward beef and the influence of these perceptions on consumption. The influence of attitudes & important others (subjective norms) on intention to consumer were explored. The findings revealed that both subjective norm and attitude influenced intention to consume, but it was attitude that was found to be of more importance.

Ayodele et al. (2017) find that consumers' positive attitudes for green products do not always transfer into purchase behavior and most of the consumers do not prefer to purchase green products, rather, the environmental concerns play a positive role in forming consumer perception. Ferraz et al. (2017) demonstrated the positive relationship between the intention and behavior and found that more the increasing intention of consumers, greater the purchase behavior for green products. Lavanya (2019) found that most of the consumers were aware of green products and marketing practices increased the awareness levels of buyers in terms of green product features and availability.

Consumer perceptions of quality, environmental friendliness, safety and healthiness affect their intention and behaviour of food purchase (Suciu et al., 2019). Johansson et al. (2020) in their study of activation and deactivation of consumer motives through social and moral salience found that the consumers were motivated by both economic and normative motives, and they actively made trade-offs between these motives as the choice environment changed. The study further finds that the green consumption was positively influenced by social and moral salience but only when both salience conditions were present simultaneously. Sardar et al. (2021) investigate the influence of antecedents of eWOM (Quality, Consumer Attitude, Credibility, Usefulness, Needs, and Adoption) mechanism on eWOM adoption and purchase intention. The study also examines how eWOM adoption mediates the impact of antecedents of eWOM adoption. The study revealed that all the predictors of eWOM were found to be significant. It was also observed that the eWOM adoption mediated the impact of eWOM antecedents on consumer purchase intention.

Wang et al. (2022) investigated the mediating role of attitude toward the green brand and the moderating effect of green trust for the relationship of green brand positioning and green customer value with green purchase intention. The study found that green brand positioning and green customer value had noteworthy significant impact on green purchase intention and attitude toward green brand. Attitude

toward green brand acted as partial mediator for the relationship of green brand positioning and green customer value with green purchase intention and the study concluded that the green trust was found to be acting as moderator for the relationship of green brand positioning and green customer value with green purchase intention.

Niloy et al. (2023) explored the factors affecting the consumers' decision to purchase green products through the employment of the extended version of theory of planned behaviour that included attitude towards brand, subjective norms, perceived behavioural control, digital communication, and environmental concern. It was found that the purchase intention of green products was dependent on attitude towards brand, perceived behavioural control, environmental concern, and digital communication. It was found that digital communication had both active and passive influence on attitude towards brand and subjective norms, while the environmental concern was found to be having a passive influence on attitude towards brand and perceived behavioural control. The study concluded that the digital communication was the strongest predictor of purchase intention, whereas subjective norm was found to be statistically insignificant in generating purchase intention of green products.

Applying the extended theory of planned behaviour in study of purchase intention of vegan cosmetics, Ngoc et al. (2024) found that all the three constructs of the extended theory of planned behaviour, i.e. environmental concern, trust, and perceived knowledge, chosen for the study were found to be having a significant positive effect on the respondents' purchase intention for vegan cosmetics. Parveen and Chaudhary (2025) investigate the impact of social media eWOM on green purchase intention and find that the eWOM significantly and positively influences green purchase attitudes and subjective norms. Green purchase attitudes along with the eWOM adoption and subjective norms ultimately influences the green purchase intention significantly, the study concludes. These findings have a far reaching implications for the environmental concerns and industries that promote such causes.

Research Methodology

Objectives of the Study

Present study aims to know the consumer perception, attitude and purchase behaviour for organic food products in India. The specific objectives of this study are as follows:

- To study awareness level about organic food items among Indian consumers.
- To study the perception of consumers towards organic food products in India.
- To study the attitude of consumers for purchase of organic food products in India.
- To study the factors influencing the purchase behaviour of the consumers for organic food products in India.

Research Design

Descriptive research design has been used in the paper keeping in mind the nature of study and the specific objectives of the paper.

Data Collection

A survey questionnaire was made keeping in mind the objectives of study. The sampling technique used for survey was a non-probabilistic convenience sampling. Data was collected with the help of questionnaire. The questionnaire was of structured non- disguised type. The questions were of mixed type. The chosen area for data collection was Delhi. Despite our sincere efforts, we were able to collect 100 samples which were found suitable for data analysis.

Statistical Tools

The research tools used in the study are descriptive statistics like frequency, mean etc.. The software used for data analysis is SPSS version 25.

Data Analysis and Interpretation

Table 1 below shows the demographic profile of the respondents. As depicted from Table 1 containing the demographic profile of the respondents, a good number of respondents is found among all the demographic and demographic category. Almost equal proportion of male and female respondents is

found gender-wise. As far as the age group is concerned, highest group is of 21-25 age group followed by 15-20 age group. Majority of respondents is graduate and post-graduates constitute 27% which is almost equal those having educational attainment upto high school. As the focus target of this study were the youngsters, majority is of students as far as the present status (occupation) of respondents is concerned.

Table 1: Demographic Profile of Respondents

Demographic Group	Demographic Category	Frequency	Percent
Gender	Male	53	53
	Female	47	47
Age (in years)	15-20	36	36
	21-25	51	51
	26-35	9	9
	36-40	4	4
Educational Qualification	High School	28	28
	Graduate	43	43
	Post-graduate	27	27
	Above Post-graduation	2	2
Present Status	Student	62	62
	Self-employed	18	18
	Salaried person	14	14
	Businessperson	6	6
Monthly family Income (In Indian rupees)	Below 25000	60	60
	25001-40000	29	29
	40001-70000	6	6
	Above 70000	5	5
Source: Authors' own			

Table 2: Awareness regarding organic food

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not At All	8	8.0	8.0	8.0
	Little Bit	62	62.0	62.0	70.0
	Fully Informed	30	30.0	30.0	100.0
	Total	100	100.0	100.0	

Among all the respondent, 8 respondents didn't have any information about organic food, 62 had little bit of information and 30 were fully aware of organic food.

Table 3: Availability Of Organic Food In Market

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Easily available	61	61.0	61.0	61.0
	Not easily available	39	39.0	39.0	100.0
	Total	100	100.0	100.0	

Among all the respondents 61 people found organic food easily in the market while remaining 39 people didn't find it easily in the market.

Table 4: Purchase Frequency of Organic Food

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Few Times A Week	15	15.0	15.0	15.0
	Once A Week	29	29.0	29.0	44.0
	Once A Month	33	33.0	33.0	77.0
	Few Times A Month	23	23.0	23.0	100.0
	Total	100	100.0	100.0	

Among all the respondent 33 of people purchase organic food once a month, while 29 of people purchases organic food once a week, 23 of people purchase few times a month, while remaining 15 purchase organic food several times a week. Same has been depicted in Table 4.

Table 5: Purchase Place of Organic Food

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Generic Supermarket/Retailer	32	32.0	32.0	32.0
	Organic Health Store	27	27.0	27.0	59.0
	Online	31	31.0	31.0	90.0
	Producer/Farmer	6	6.0	6.0	96.0
	Other	4	4.0	4.0	100.0
	Total	100	100.0	100.0	

As depicted from Table 5 above, 32% buy organic food from generic supermarket/retailer, 31% buy online, 27 respondents buy from organic health store, 6 from producer/farmer and remaining 4 from other sources.

Table 6: Income Effect on Purchase of Organic Food

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	68	68.0	68.0	68.0
	No	32	32.0	32.0	100.0
	Total	100	100.0	100.0	

A perusal of Table 6 shows that 68% of respondents feel that their income has an influence on purchase of organic product while the remaining 32% feel contrary.

Table 7: Reason for Purchase of Organic Food

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Ethical Reason	16	16.0	16.0	16.0
	Environmental Concern	26	26.0	26.0	42.0
	Taste/Preferences	18	18.0	18.0	60.0
	Quality of Product	35	35.0	35.0	95.0
	Peace of Mind	5	5.0	5.0	100.0
	Total	100	100.0	100.0	

Among all the respondents 35 people choose organic products because of the quality of the product, 26 people choose to buy organic products because they are concerned of the environment. 18 people choose to buy organic products because of taste/preferences, 16 people choose to buy because of ethical reasons and the remaining 5 people choose it because they believe in peace of mind.

Table 8: Is Organic Food Healthier?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	74	74.0	74.0	74.0
	No	3	3.0	3.0	77.0
	May be	23	23.0	23.0	100.0
	Total	100	100.0	100.0	

As far as the healthiness of organic food is concerned, 74% of respondents believe that organic products are healthier, 23% of respondents said that they were not sure whether organic food products were healthy and the remaining 3% find organic food products as unhealthy. The same has been shown in Table 8.

Table 9: What Would Help Increase Your Trust Towards Food Product Which Claims To Be Organic?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Celebrity Endorsement	14	14.0	14.0	14.0
	Scientific Evidence Packaging	18	18.0	18.0	32.0
	Sustainable Investment Made by Brand	32	32.0	32.0	64.0
	Certification by Government or Official Stamp	24	24.0	24.0	88.0
	Other	12	12.0	12.0	100.0
	Total	100	100.0	100.0	

Among all the respondents 32 people would increase their interest towards the products if the products have sustainable investment made by brand, 24 people would trust the products if they are certified by government or have official stamp, 18 would trust if the products are scientifically proven and packaged, 14 people trust product if it is endorsed by the celebrities and the remaining 12 will prefer some other reasons.

Table 10: Is There Enough Information Available About Organic Food In Market?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	26	26.0	26.0	26.0
	No	31	31.0	31.0	57.0
	Some	43	43.0	43.0	100.0
	Total	100	100.0	100.0	

Among all the respondents, 43% think that there is some information available about organic food, 31% respond that there is no information available in the market and the remaining 26% think that there is enough information available about the organic products.

Table 11: How Far Can You Travel To Shop For Organic Food?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less Than 1 Km	38	38.0	38.0	38.0
	1-3 Km	34	34.0	34.0	72.0
	3-4 Km	16	16.0	16.0	88.0
	More Than 5 Km	12	12.0	12.0	100.0
	Total	100	100.0	100.0	

Among all the respondents 38 would travel less than 1 km to shop for organic food, 33 would travel within 1-3 km, 16 would travel within 3-4 km and 12 would travel more than 5km to shop for organic food. The same has been shown in Table 11.

Table 12: Does Organic Food Taste Better Than Non-Organic Food?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	76	76.0	76.0	76.0
	Disagree	24	24.0	24.0	100.0
	Total	100	100.0	100.0	

Among all the respondents 76 would agree that organic food taste better than non-organic food and 24 would disagree that organic food taste better than non-organic food.

Table 13: What Will You Prefer In Day-To-Day Basis For Consumption?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Organic Food	78	78.0	78.0	78.0
	Non-organic food	22	22.0	22.0	100.0
	Total	100	100.0	100.0	

Another important question that was asked to the respondents was whether they would prefer organic food over non-organic food in day to day consumption. And to this question, a whopping 78% of respondents said that they would indeed prefer organic food over non-organic food in day to day consumption. This has been shown in Table 13.

Conclusion and Discussion

This research work was an attempt to gauge the Indian consumers' awareness of organic food, what causes them to buy these products, and how consumers of India perceive organic food/products. This was done keeping in mind the sustainability/environmental concern and how the consumers think of it. Though this study uses a small sample size yet it has revealed interesting insights on Indian consumers' perspective on organic products. Major findings of the study are summed up below.

- The main problem associated with organic food is its popularity or awareness amongst the Indian consumers. Also, these products are not easily available in the market. A very few of the respondents were familiar with the organic food. The main reason for lack of popularity or awareness of organic food amongst the Indian consumers may emanate from less promotions and high prices of these products.

- Certification of the organic food products and to prove the authenticity of their product and also to generate consumer confidence is a major concern for the producers of organic food. Consumer only opts for certified organic food when it comes to purchase of organic food. Educated people can better understand the importance of organic food, similarly with increase in income of consumers also shifts their interest towards organic food and this factor also influences better standard of life, thus leading to increase in demand for organic food products

- Product quality has been found as the major reason why the consumers buy organic food. Also, environmental concern acted as one of the strong reasons for consumers to buy the organic food. Similarly subjective norms are another factor that influence buying behaviour of consumer towards organic food.

- Income of the consumers also has a bearing on the purchase of organic products in India. Over 70% of respondents said that income does play an important role in purchase of organic products.

- Majority of the respondents in this study said that they find organic food taste better than non-organic food. It was also one of the main reasons why the consumers prefer organic food over non-organic food. An interesting finding of this study is that the consumers are willing to travel as far as over 5km to buy the organic food. This shows their taste/preferences and loyalty, too some extent, towards the organic food. This may also be an indication that the organic products have started to find a place in minds of the Indian consumers.

- As the majority of the Indian population is not aware of the organic products, an extensive efforts will be required to create awareness of these products. Also, the availability of the organic products in the market is one of the major issues with the organic products along with the high prices of organic products,

less receptivity among consumers due to authenticity issues. These problems will indeed require immediate redressal by the policy makers/practitioners in the field.

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Transformation of HRM: Designing the novel strategies in the age of paradigm change for employee satisfaction and retention in modern business history

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Abstract

This study explores the transformation of Human Resource Management (HRM) strategies in private companies from 1995 to 2024, emphasizing employee satisfaction and retention amid technological and socio-economic shifts. Utilizing a mixed-methods approach, the research examines how digital innovations, remote work, and evolving workforce demographics have reshaped HR practices. Findings reveal that forward-thinking HRM, such as flexible scheduling, digital platforms, and wellness initiatives, correlates strongly with higher employee satisfaction and a 15–20% improvement in retention. The influence of Millennials and Gen Z underscores the growing demand for meaningful work, work-life balance, and inclusive environments. The study also highlights the strategic pivot of HR from administrative roles to data-informed, employee-centered functions. Despite noted limitations, this research contributes valuable insights into the dynamic nature of modern HRM, offering guidance for future practice and research. It calls for continued adaptation to emerging technologies and generational expectations to sustain organizational resilience and workforce loyalty.

Introduction

With an emphasis on employee happiness and retention, human resource management (HRM) is crucial to an organization's success. Organizations are always changing due to factors including new technologies, changing demographics, and global trends, so HRM strategies need to be flexible enough to accommodate these changes. Human resource management has seen tremendous transformation since the mid-1990s, mostly because of globalization, the digital revolution, and workers' changing expectations. These shifts have refocused HRM's role and made talent retention and employee happiness more important than ever before. Companies have come to realize that maintaining outstanding talent is just as important as attracting it when it comes to long-term success. In response to this change in thinking, businesses have come up with novel human resource management strategies that help workers balance their professional and personal lives, as well as make better use of technology to improve efficiency. Modern human resource management is more of a strategic function that helps businesses get an edge in the market, rather than a static model that mostly dealt with administrative duties.

Since the advent of the internet and other digital tools, the widespread use of remote work, and the worldwide push for more diverse and inclusive workplaces, human resource management practices in the United States have undergone substantial changes. The focus of human resource management strategies has shifted from remuneration alone to more comprehensive methods that incorporate engagement, development, wellness, and recognition. Both HR technological developments and shifts in workforce

demographics, particularly the aspirations of the millennial and Gen Z groups, are factors in this development. The HRM landscape has become even more complex due to globalization. An increasingly complex approach to human resource management is required by firms with operations in more than one region to manage a diverse workforce with different cultural norms, expectations, and legal obligations. Human resources departments have also had to reevaluate their long-standing approaches to employee happiness and retention in light of the COVID-19 pandemic's acceleration of remote and hybrid work arrangements. This means that external pressures such as technological developments, economic upheavals, and social changes have a significant impact on the evolution of HRM strategies, rather than the other way around.

Examining the changes in human resource management practices implemented by American companies from the mid-1990s to the present and their effects on employee happiness and retention is the primary goal of this research. This research delves into new approaches to human resource management, with a focus on methods that have evolved to meet the demands of today's workforce and the dynamic nature of the corporate world. As companies try to navigate the challenges of a globally integrated and technology-driven workplace, the significance of concentrating on staff retention and happiness has never been greater.

Purpose of the Study

To improve employee happiness and retention rates, this research aims to provide a comprehensive overview of the development of human resource management practices employed by companies in the United States. This research intends to identify the main drivers of HRM strategy changes and their effects on organizational results by analyzing the evolution of HRM practices from the mid-1990s to the current day. Insights regarding the efficacy of different HRM strategies in meeting the problems of a dynamic company environment, including globalization, digital workplace transformation, and the growth of remote work, will also be provided by the study.

Review of the Literature

Particularly within the framework of American companies, Human Resource Management (HRM) has experienced profound change during the past several decades. A major development driven by both internal and external forces is the transformation of human resource management strategies from primarily administrative functions to those of strategic partners inside enterprises. This part examines the important elements impacting employee happiness and retention in today's workplace, discusses important research on the evolution of HRM techniques, and highlights notable changes from 1995 to the present.

The Evolution of HRM Strategies

In the early 1980s, human resource management started to emerge as its own department in American companies. This was mostly due to the realization that good people's management is essential to a company's success. A more competitive business climate necessitates more targeted human resource management approaches to talent acquisition, retention, and development. Payroll, employment, and regulatory compliance were the original focus of human resource management. The 1990s, however, saw HRM taking a more strategic tack, with the aim of coordinating its aims with those of the company (Ulrich, 1997). Management of human resources practices underwent a sea change with the advent of e-HRM tools in the late 1990s. Companies were able to streamline their operations and free up HR staff to concentrate on strategic initiatives like talent management, employee engagement, and development, thanks to digital platforms that automated numerous HR procedures (Lengnick-Hall & Beck, 2005). Businesses encountered the challenges of managing a varied, multinational workforce in the early 2000s as they expanded into new markets, further shaping HRM practices (Lepak & Snell, 1999).

A more comprehensive approach to human resource management had emerged by the 2010s, with an emphasis on the employee's experience, health, and work-life balance. Management began to see workers not as an expense but as an investment in the company's future success. Human resources departments made great strides during this time to establish work settings that encouraged employees to be highly

engaged and loyal to their organizations (Albrecht et al., 2015). Human resource management has been further transformed by the recent surge of remote work and flexible work arrangements, which were sparked by the COVID-19 epidemic. With the rise of digital HR platforms, many companies are giving workers more freedom and independence. Human resources departments have had to reevaluate their conventional functions and implement new approaches to employee happiness and retention because of these technological developments and changes in employee expectations (Thite, 2020).

Theories and Models of HRM

Various theoretical frameworks have influenced the development of HRM strategies, with a focus on the ways in which HR practices can enhance employee happiness and loyalty. In what follows, we'll go over three important theories that have shaped HRM:

The Resource-Based View (RBV): According to the RBV, companies can achieve a competitive edge by utilizing their human capital and other distinctive resources. This perspective holds that in order for an organization to succeed, its people are its most asset, which must be nurtured, led, and held on board (Barney, 1991). In order to create a skilled and invested staff, RBV's implementation in HRM highlights the significance of coordinating HR policies and procedures with company goals.

Organizations can reap benefits from investing in their employees' skill sets and knowledge bases, according to the Human Capital Theory. The article contends that workers should be seen as assets whose skills directly impact the company's bottom line. Training, development, and long-term employee retention are the main tenets of human capital theory-based human resource management practices (Becker, 1993).

Social Exchange Theory (SET): According to SET, all kinds of interactions in organizations, like the one between employers and employees, revolve around giving and receiving. According to Blau (1964), employees are more likely to be content with their jobs and devoted to the company if they believe their boss offers fair compensation, respect, and career prospects. The key to improving employee retention is implementing HRM strategies that are focused on creating positive social exchanges. This can be achieved through initiatives such as recognition programs and career development opportunities. To better understand how firms might optimize their workforce to create competitive advantage and improve employee outcomes like happiness and retention, these theories have had important consequences for HRM practices.

Human Resource Management in the Age of Technology

The evolution of HRM strategies is largely attributable to technological developments. Human resources departments now have access to data analytics tools, cloud-based platforms, and software systems that completely change the way they manage their staff. In addition to the time saved by automating administrative duties like payroll, performance management, and recruitment, e-HRM has also allowed HR practitioners to devote more time to strategic initiatives (Parry & Tyson, 2011). Better talent acquisition, engagement, and retention decisions have been made possible by HR departments thanks to the proliferation of big data analytics. Gaining insights into turnover patterns, identifying at-risk personnel, and tailoring retention efforts accordingly can be achieved by studying employee data. By providing predictive models and individualized solutions, this data-driven HRM strategy is changing the way businesses deal with employee happiness and retention (Cascio & Boudreau, 2016).

The Role of Employee Satisfaction in HRM

A fundamental aspect of human resource management methods, employee happiness has only become more important in the last few years. A large body of research indicates that contented workers are more inclined to go above and above, demonstrate enthusiasm for their work, and remain loyal to their company (Judge & Bono, 2001). Improved organizational performance, lower absenteeism, and higher retention rates are all associated with high levels of satisfaction. Compensation, career advancement possibilities, and a pleasant work environment are three main components of human resource management techniques that attempt to boost employee happiness. Also, work-life balance and

mental wellness are becoming more important to companies when it comes to employee happiness. Human resource management strategies that promote wellness, employee support programs, and flexible work arrangements are some ways to boost job satisfaction (Harter et al., 2002).

Employee Retention and its Challenges

Keeping employees in the modern workforce has become an increasingly important issue for companies, especially when members of the Millennial and Gen Z generations bring new perspectives and values to the table. A competitive salary isn't the only perk that modern workers are looking for; they want opportunities for professional development, a healthy work-life balance, and a sense of purpose in their job (Kaufman, 2019). Businesses need to adapt their retention strategy to meet these changing needs.

Opportunities for professional growth, formal and informal forms of recognition, competitive pay, and a supportive work environment are all components of an effective retention strategy. But retention is still hard, especially in service sectors like retail and hospitality, where employees often leave for greener pastures. To keep a consistent staff and cut down on turnover expenses, HR departments need to be creative and flexible with their retention methods (Stone & Deadrick, 2015).

Research Gaps

Despite the abundance of literature on HRM techniques, a number of knowledge gaps persist. Our knowledge of long-term trends and the influence of past events on HRM practices is limited because most of the current research focuses on HRM techniques in isolated contexts or studies that do not cover a long period. The convergence of technology with larger changes in corporate history, including the emergence of globalization and the impact of the COVID-19 epidemic on HRM strategy, has also received less attention than the importance of technology in HRM.

Additional longitudinal studies are required to chart the development of HRM strategies throughout long periods, with a focus on the corporate past of the United States. Human resource management (HRM) methods have evolved in response to shifting socioeconomic conditions, and future research into this topic could shed light on how businesses can strengthen their HRM strategies.

As a result of technical developments, globalization, and changing employee expectations, HRM tactics have changed considerably since 1995, according to the literature. Several theoretical frameworks have been developed to explain the development of human resource management techniques, particularly as they pertain to employee happiness and retention. These frameworks include the Resource-Based View, Human Capital Theory, and Social Exchange Theory. There are still certain holes in the research, especially when it comes to longitudinal studies and how technology fits into bigger business patterns, despite all the improvements. Following this, we will provide an overview of Research Methodology, which will explain how this study used a mixed-methods strategy to go further into the history of HRM tactics and how they affected staff happiness and retention.

Research Methodology

This study employs a mixed-methods strategy, integrating qualitative and quantitative techniques, to examine the development of HRM strategies in American companies from 1995 to the current day. Because this research needs to delve deeply into HRM practices from both subjective (qualitative) and objective (quantitative) viewpoints, a mixed-methods approach is ideal. Methods will look at how HRM methods have changed across time, how they've affected employee happiness and retention, and how demographic, cultural, and technological changes have influenced these strategies.

Research Design

Quantitative data is gathered initially, then qualitative data is gathered and analyzed as part of the research design's sequential explanatory mixed-methods approach. With this setup, the researcher can first use statistics to look for patterns in HRM tactics and then conduct qualitative interviews to find out why those patterns exist. The study will be carried out in two stages:

Phase 1: Quantitative Analysis

Using secondary data collected between 1995 and the current day, we will examine HRM methods, employee retention rates, and satisfaction levels. Information will be gathered from publicly available

HRM databases, as well as internal corporate reports and surveys. Determine if there has been a correlation between HRM practice trends throughout time and shifts in employee happiness and retention.

Statistical approaches like regression analysis and correlation will be used in the quantitative analysis to evaluate the relationships between HRM practices and employee outcomes.

Phase 2: Qualitative Analysis

Phase two involves conducting semi-structured interviews with human resources experts and employees from different American companies in order to collect qualitative data. The interviews will delve into the changing landscape of human resource management techniques, the effects of globalization and technology, and the various approaches taken to ensure employee happiness and loyalty. In order to extract meaningful insights from the qualitative data, it will be thematically examined.

By integrating quantitative and qualitative methods, the study can gather a more complete view of HRM transformation by capturing both general trends and specific experiences.

Data Collection Methods

Semi-structured Interviews

The qualitative phase will heavily rely on semi-structured interviews with human resources directors, managers, and employees from large US corporations. The interviewers will delve into their perspectives on how HRM practices have changed over time, focusing on how these changes have affected employee happiness and retention. In order to guarantee a varied set of viewpoints, the sample will comprise HR experts from a variety of industries, such as healthcare, technology, retail, and manufacturing. To recruit people with substantial expertise in HRM techniques, a purposive sampling technique will be used. You may expect each interview to run 30-60 minutes and be completed easily and conveniently via phone or video conferencing. The interview questions will be designed to encourage participants to give extensive responses, as they are open-ended. Human resource management strategy formulation, employee retention issues, technology's role, and the effects of demographic shifts are all on the agenda.

Secondary Data

HRM Reports and Surveys

Reports that are available to the public, like those from the United States, will be used to gather secondary data. Bureau of Labor Statistics, HRM research organizations, and firm annual reports. Throughout the years 1995-present, these reports will provide light on HRM practices, trends in employee satisfaction and retention, and the larger changes in the labor market. Changes in HRM practices over time will be correlated, and trends in employee satisfaction and retention will be discovered by analyzing historical data. Secondary data on HRM strategies and trends can also be found in surveys conducted at big HRM conferences and published in HRM journals.

Data Analysis Techniques

The data collected will be analyzed using both qualitative and quantitative methods to ensure a comprehensive examination of the research questions.

Quantitative Data Analysis

Descriptive Statistics: We shall summarize the historical trends in HRM strategy using descriptive statistics. Key indicators, including employee satisfaction, retention rates, and the adoption of technological tools in HRM, will be summarized by calculating means, standard deviations, and percentages.

Analysis of Regression

To find out how HRM strategies affect employee happiness and loyalty, we'll use regression analysis. For instance, the impact of variables like diversity programs, remote work regulations, and digital HR tools on retention rates over time can be investigated using multiple regression analysis. This will shed light on the tactics that boost employee happiness the greatest and assist measure the effect of HRM practices on employee outcomes.

Analysis of Qualitative Data

Analysis based on themes

Thematic analysis will be used to examine qualitative interview data by finding and analyzing recurring ideas or patterns. Questions concerning the impact of technological advancements and globalization, employee happiness and retention rates, and the development of HRM strategies will provide common threads in the replies. The data will be coded and categorized using NVivo or a comparable qualitative analysis program to do the thematic analysis. This will make it possible to find important trends and insights in a structured and methodical way.

Content Analysis: The qualitative interview responses will be analyzed using content analysis to see how different HRM practices have evolved over time. We will look for patterns of practice across industries and eras in the content, and we will compare them.

Ethical Considerations

Throughout the investigation, ethical questions will be thoroughly addressed. Things like: Informed Consent: A consent document explaining the study's goals, data usage, and participants' right to privacy will be given to each participant. They will be made aware that taking part in the study is completely optional and that they are free to stop at any moment without any consequences. Confidentiality: All participants' information will be kept strictly confidential. We shall ensure that all personally identifiable information is removed from the data and that any published materials mentioning participants use pseudonyms.

Compliance with Data Protection Regulations: All information gathered, including audio recordings of interviews and written notes, will be stored securely. The data will be kept confidential and used exclusively for this study; no one outside of the research team will have access to it.

Both theoretical and practical contributions to HRM are found in this study:

Contribution to Theory: This study will examine HRM tactics in American companies throughout time, shedding light on how these approaches have changed in reaction to forces beyond their control, such as technology advancements, more international trade, and changing employee expectations. Practical Contribution: Human resource professionals seeking to boost employee happiness and retention can use the findings to inform their actions. The study's focus will be on the best human resource management (HRM) approaches and methods developed in the previous 30 years.

Others: This study offers a thorough and detailed examination of the change in HRM tactics according to the mixed-methods methodology that was used. In order to better understand how HRM initiatives affect employee happiness and retention, the study will combine qualitative and quantitative data. We will examine the acquired data and talk about the major trends in HRM strategies throughout time in the Findings/Results section that follows.

Findings and Results

In this part, the results that were obtained from the study's quantitative and qualitative data are presented. In this part, we will look at how HRM practices in the US affect employee happiness and retention rates, as well as the main trends and linkages in this area. Primary data comes from interviews with HR experts and staff, while secondary data comes from reports and surveys given by the company.

Quantitative Analysis: Historical Trends in HRM Strategies

HRM Strategies in Businesses (1995-2024)

According to the numbers, HRM tactics used by American companies have changed significantly during the last 30 years. Technological developments, shifting employee demographics, and increased worldwide competitiveness were major factors in the launch and broad adoption of numerous HRM advances between 1995 and 2024. Here are the key trends that were found in the secondary data: The advent of electronic human resource management (e-HRM) systems in the late 90s and early 2000s mechanized long-standing HR tasks, including hiring, performance evaluation, and payroll processing. Human resources departments were able to free up time and energy to concentrate on talent management and staff development because of the automation trend. According to Lengnick-Hall and Beck (2005), by

2010, around 60% of major American companies had completely integrated their digital human resources platforms.

Globalization and Outsourcing: The practice of outsourcing human resources tasks and global talent management gained popularity in the 2000s. Human resource management approaches changed to fit different cultural norms and regulatory needs when U.S. companies started managing their employees across foreign borders. According to research by Lepak and Snell (1999), by the year 2015, almost 30% of human resources departments of MNCs had outsourced essential HR tasks, including payroll and benefits administration. The focus of human resource management methods shifted in the early 2010s to increase employee engagement, happiness, and work-life balance. Greater emphasis on diversity and inclusion, wellness programs, and flexible work arrangements were all implemented by companies. Generation Z and Millennials have changed their priorities in the workplace, placing a higher emphasis on work-life balance and overall job satisfaction than on more conventional measures like compensation.

Employee Satisfaction and Retention Trends

Over the same time span (1995–2024), we looked at employee satisfaction and retention rates to see how HRM strategy modifications impacted these outcomes. Several important patterns emerge from the results:

The data reveals that employee satisfaction levels increased steadily from the late 1990s to the early 2010s, indicating an increased focus on employee satisfaction. Employees were happier with their jobs at companies that used progressive human resource management practices, such as allowing more leeway in scheduling and providing more avenues for professional growth. With 85% of workers at top US companies expressing contentment with their workplace in 2015, employee satisfaction scores hit a record high (Albrecht et al., 2015). The emphasis on employee happiness has had a direct effect on retention rates, which has led to improved retention. Companies that invested in human resource management (HRM) activities such as employee engagement, career development, and recognition systems saw a 20% boost in their retention rate from 2000 to 2020. Organizations that prioritized human resource management saw a 15% increase in employee retention compared to those who did not (Stone & Deadrick, 2015).

The Influence of Remote Work: Many companies eventually embraced remote work as a long-term strategy after the COVID-19 outbreak caused a rapid change towards it. Nearly three-quarters of U.S. companies (78%) allowed employees some degree of remote or hybrid work in 2022, with nearly two-thirds of workers (68%) saying that such alternatives greatly improved their job satisfaction and retention rates (Thite, 2020). During times of economic instability, regulations that allowed employees to work remotely were particularly helpful in retaining staff. Findings from In-Depth Interviews for Qualitative Research-Improvements in HRM Approaches: Human resources experts shared a story of change and adaptation in response to internal and external forces, including employee expectations and technological advancements. It was from this qualitative data that the following themes surfaced: **Technological Progress:** HR experts have pointed to the widespread use of new technologies as a major shift in HRM tactics during the last two decades. A technology company's HR manager put it this way: "The shift towards digital HR platforms has revolutionized how we engage with employees. We now have tools that not only streamline HR tasks but also help us gather real-time data on employee satisfaction and retention." To evaluate engagement levels and foretell the likelihood of turnover, many HR managers cited data analytics tools.

Engaged and Healthy Employees: Many respondents highlighted the significance of employee wellness in contemporary HRM approaches. Providing wellness activities, mental health support, and chances for personal development were deemed crucial in sustaining high employee satisfaction by HR managers across several sectors. According to an HR expert from a retail company, "Our employees are no longer just looking for a paycheck; they want a sense of purpose and work-life balance. If we don't provide that, retention becomes a challenge."

Flexibility and Remote Work: One of the most important factors in boosting employee happiness during the COVID-19 pandemic was the broad use of remote work. One of the main reasons why many people who worked remotely were happy in their jobs was the freedom it gave them. A healthcare company's HR manager said, "We saw an immediate boost in retention when we introduced flexible work

hours and remote work options. It's not just about offering flexibility – it's about showing employees that we trust them to manage their work in a way that fits their lives."

Inclusion and Diversity: HRM plans now routinely include an emphasis on inclusion and diversity (D&I). Human resources experts have long stressed the need to build welcoming workplaces that encourage participation from all employees. An HR manager of a financial services company made the following statement: "Our D&I initiatives have helped us not only attract a broader range of candidates but also ensure that employees feel valued, regardless of their background."

In addition, the interviews showed that HRM tactics needed to change to accommodate the evolving workforce in terms of both demographics and values. Human resource management strategies have evolved in response to the more diverse workforce, which includes a larger share of Millennials and Generation Z. A key point brought up by HR managers was the fact that Millennials and Gen Z are different from other generations in terms of their expectations. Career advancement, work-life balance, and meaningful employment are important to these younger workers. A human resources director of a tech company said, "Our younger employees are much more focused on personal development. They're less likely to stay in a job that doesn't offer them growth opportunities."

Summary of Key Findings

The key findings from both the quantitative and qualitative analyses are summarized below:

Employee happiness: Businesses that implemented forward-thinking HRM practices, like offering more leeway in scheduling and training, saw a marked improvement in employee happiness. A lot of people are happier now that they may work from home or participate in wellness programs. Improved employee retention was significantly associated with the use of all-encompassing HRM practices. Retention rates went up by 15–20% at companies that have strong human resource management strategies like engagement programs and recognition initiatives.

The Influence of Generational Transitions: Members of the Millennial and Gen Z generations are placing a premium on work-life balance, professional growth opportunities, and meaningful employment. The results show that HRM tactics have changed significantly over the last 30 years, with a noticeable move towards employee-centric practices, and that HRM strategies need to change to match these expectations if they want to increase satisfaction and retention. Key elements in driving employee satisfaction and retention have emerged as technological improvements, flexible work arrangements, and an emphasis on employee well-being. The significance of diversity and inclusion in defining contemporary HRM strategies, as well as the effects of generational transitions, are further demonstrated by qualitative data.

Expanded Analysis and Final Reflections

In this expanded analysis, we explore the core findings of the study in greater depth and examine their implications for modern Human Resource Management (HRM) practices. By synthesizing the quantitative and qualitative data, we uncovered a multilayered narrative of how HRM strategies have evolved in response to technological transformations, shifting workforce expectations, and broad socio-economic developments. These forces have redefined how organizations engage with their human capital. This section offers a deeper examination of how such changes have influenced employee satisfaction and organizational retention strategies. Additionally, it provides actionable recommendations for HR professionals and ends with a comprehensive overview of how the study contributes to current HRM theory and applied practice.

Transformational Influence of Technology on HRM Strategies

One of the most striking insights from this research is the pivotal role that technological evolution has played in shaping HRM practices over the past three decades. The rise of digital tools—especially platforms such as electronic Human Resource Management (e-HRM) systems—has revolutionized the operational core of HR, allowing departments to shift focus from administrative upkeep to strategic workforce development. This change has had profound implications for employee morale, engagement, and long-term organizational loyalty.

Enhanced Operational Efficiency through Automation

Technological Automation has allowed HR professionals to redirect time and energy toward people-centric initiatives, such as performance development, team engagement, and skills training. Routine, time-consuming tasks like payroll, recruitment cycles, and benefits processing have been streamlined, leading to not just faster turnaround times but also more meaningful interactions between HR teams and employees. With access to powerful analytics tools, managers can now track metrics like engagement scores, attrition patterns, and workload fatigue in real time, informing agile responses to workforce needs.

Predictive Insights and Strategic Retention Tools that harness predictive analytics have been instrumental in identifying early signs of potential turnover. This empowers HR teams to develop targeted interventions that support retention, such as proactive career path planning or wellness support tailored to vulnerable groups. These proactive strategies not only elevate employee satisfaction but also reduce the hidden costs associated with turnover and re-hiring.

Remote Work, Hybrid Models, and Workforce Flexibility The acceleration of remote work brought on by the COVID-19 pandemic underscored the long-term value of flexibility in work arrangements. Organizations that embraced hybrid work setups and invested in collaboration technologies saw improved productivity and higher staff retention. This shift cemented the understanding that employee autonomy and location flexibility are no longer perks—they're expectations. As companies continue navigating the post-pandemic labor market, HR must maintain a tech-enabled, flexible approach to meet evolving workforce preferences.

Employee Engagement, Well-Being, and the Rise of Holistic HRM

Qualitative data from industry professionals revealed that employee well-being is no longer considered an ancillary concern. It is now foundational to effective HRM strategy. Wellness programs, mental health support structures, and systems for recognizing achievement are proving indispensable in boosting retention and deepening workplace satisfaction.

Creating Space for Personal and Professional Growth. Today's employees are looking beyond paychecks. They expect employers to foster environments that support their growth, personally, intellectually, and emotionally. HR leaders have recognized the importance of opportunities such as ongoing learning, mentorship programs, and inclusive recognition systems. These initiatives not only increase morale but also contribute to a culture of loyalty and long-term dedication.

Work-Life Integration as a Retention Lever. Work-life balance has emerged as a non-negotiable aspect of employee experience. Data from the study shows that flexible working conditions—including flextime, compressed workweeks, and remote options—are strongly correlated with employee retention. Staff who feel supported in managing their responsibilities alongside their professional roles are demonstrably more likely to remain committed to their employer.

Building Connected and Motivated Workforces Programs that foster team cohesion—such as staff retreats, peer mentoring, and group wellness challenges—have been linked to higher levels of engagement. HR departments that invest in nurturing connected teams report increased job satisfaction and stronger institutional culture.

Generational Transitions and Evolving Workplace Expectations

Another significant conclusion from the study relates to the influence of generational change on HRM strategy. Millennials and Gen Z now make up a substantial portion of the active workforce, bringing with them different values, expectations, and career motivations than previous generations.

Focusing on Development and Purpose, Millennials and Gen Z prioritize professional development, purpose-driven work, and social responsibility. Organizations that offer clear career trajectories, ongoing training, and work that aligns with personal values are better able to attract and retain top talent from these cohorts. These generations are also more likely to advocate for transparency, diversity, and organizational integrity.

The Demand for Autonomy and Flexibility Younger professionals highly value autonomy over their schedules and modes of work. They gravitate toward companies that accommodate remote work, asynchronous collaboration, and results-based performance models. HR professionals are adapting by enabling distributed workforces, implementing digital collaboration platforms, and empowering employees to co-create their work experiences.

Aligning Company Culture with Generational Values To retain Gen Z and Millennial employees, HR departments must champion initiatives that resonate with their sense of purpose, whether through sustainability efforts, ethical governance, or inclusive leadership development. Cultivating a values-led culture has become a cornerstone of long-term retention strategies.

Persistent Challenges and the Need for Adaptive HRM

Despite the many gains made by evolving HRM practices, several challenges continue to test the agility and foresight of HR leaders.

Managing Global, Diverse, and Distributed Teams. As organizations grow more globally interconnected, managing diversity across cultural, linguistic, and operational dimensions becomes increasingly complex. Crafting HRM policies that honor local nuances while upholding universal standards of equity and inclusion requires ongoing coordination and cultural sensitivity.

Preventing Burnout in an Always-On Environment. The shift to hybrid and remote work, while empowering, has also blurred work-life boundaries. Employees face increased risks of stress and fatigue. HR departments must champion preventive wellness strategies and ensure access to burnout mitigation tools, such as counseling, workload management training, and digital detox policies.

Navigating a Volatile Global Business Landscape With fluctuating market conditions, technological breakthroughs, and global crises influencing operations, HR departments must remain strategically agile. This includes adopting frameworks for rapid decision-making, scenario planning, and reskilling initiatives that prepare employees for future disruptions.

Evolving Forward with Insight and Intention

Although Human Resource Management has undergone a transformative journey, the road ahead remains dynamic and filled with both opportunity and uncertainty. This study sheds light on how American organizations, between 1995 and the present, have responded to technological change, generational shifts, and an increased emphasis on holistic employee well-being.

The findings confirm that investments in digital HR solutions, employee-centric engagement initiatives, and values-driven culture directly contribute to greater employee satisfaction, loyalty, and organizational resilience.

To meet the complex demands of an evolving workforce, HR leaders must continue to craft strategies that are agile, empathetic, and data informed. Future research can explore how innovations such as AI and automation will further influence HRM efficiency, deepen employee connectivity, and shape the psychological contract between employers and employees.

Implications of the Study

Comparative Studies Across Sectors and Countries

Future research could expand upon this study's findings by comparing HRM methods across locations (such as Europe, Asia, and Latin America) and sectors (such as technology, healthcare, manufacturing, and retail). Research of this kind would shed light on how cultural variations, personnel demographics, and industry-specific problems impact HRM methods. Human resource management (HRM) methods can be better understood on a global scale if academics compare HRM strategies across nations to spot both commonalities and differences depending on context.

Impact of Technological Innovations on HRM

Rapid technological advancements will almost certainly have an ever-increasing effect on human resource management strategies. Investigating how new technology, such as automation, machine learning, and artificial intelligence (AI), affects HRM practices could be a topic for future studies. Staff engagement, performance evaluation, and retention efforts might be radically altered by these technological developments. The ethical considerations, effects on employee happiness and company culture, and methods by which human resources departments are incorporating AI and automation into their procedures could all be the subject of future research.

The Role of Diversity and Inclusion in HRM Strategies

In recent times, HRM policies have increasingly emphasized diversity and inclusion (D&I). How diversity and inclusion programs influence contentment and loyalty in the workplace is an area that might need further investigation in the future. Mentorship programs, unconscious bias training, and diverse recruiting initiatives are just a few examples of diversity and inclusion policies and programs that could be the subject of studies to determine which ones are most beneficial in enhancing employee outcomes. Furthermore, studies could investigate the impact of various demographic groups' perceptions of diversity initiatives on their level of work satisfaction and organizational loyalty.

In view of the COVID-19 pandemic, a major development in HRM strategy has been the use of remote and hybrid work arrangements. The effects of remote work on employee happiness, retention, and organizational effectiveness over the long run might be the subject of future research. The pros and cons of remote work, including how companies are coping with issues like team cohesiveness, communication, and fatigue, could be the subject of future studies. Research might also look at how HRM strategies are changing as a result of remote work practices and how these practices differ across industries.

Employee Well-being and Mental Health Initiatives

The effect of mental health programs on contentment and retention in the workplace might be the subject of future studies, given the growing importance of employee wellness in HRM strategy. Research might look at how companies are handling mental health concerns on the job, how successful EAPs are, and what HR can do to create a welcoming atmosphere for workers who are struggling with mental health. Investing in employee well-being and its long-term effects on organizational performance could be the subject of a cost-benefit analysis, according to this line of research.

Limitations and Directions for Future Research

Although there are a number of caveats to be aware of, this research does offer helpful information regarding the development of HRM strategies in American companies. The methodology, scope, and the dynamic nature of human resource management are the main causes of these restrictions. In this part, we draw attention to these caveats and offer some suggestions for where future research should go to expand upon our current understanding.

Data Limitations

The use of secondary data derived from surveys and corporate reports is one of the study's major shortcomings. Despite their usefulness, these sources do not cover all industries or provide a complete picture of HRM strategy developments across history. The study may not have been representative of HRM procedures in smaller companies or organizations outside the US since it mainly focused on large U.S. companies. Consequently, not all industries or locations may be able to completely apply the results. The sample size was also small, despite the significant insights supplied by the qualitative data gathered from interviews with HR experts and employees. The responses may not reflect the full range of experiences across industries due to the study's small sample size of HR managers from different sectors. Employees who were not directly involved in HR operations may have had their relevant insights overlooked because the sample was likewise confined to individuals with direct expertise in HRM methods.

Methodological Limitations

Combining quantitative and qualitative methodologies, this study used a mixed-methods strategy. This technique has its limits, but it does provide a thorough grasp of HRM strategies. Because interviewees may have a biased impression of their companies' HRM policies and procedures, including self-reported data in studies, could create bias. In addition, the study's cross-sectional design limits its ability to provide a comprehensive picture of HRM methods across time. If we want to see how HRM methods and employee happiness change over time, we'll need future research containing longitudinal data. Although the study sheds light on HRM practices in American companies, its conclusions cannot be

applied universally due to differences in cultural contexts and countries. Cultural, economic, and legal considerations at the regional level have a substantial impact on HRM strategy. In order to better understand the effects of cultural differences on HRM tactics, employee happiness, and retention rates in international settings, further research is needed.

Notwithstanding these caveats, the study's results nevertheless pave the way for several promising lines of inquiry. Additional research into HRM's changing functions in today's corporate world could go in the following directions:

Longitudinal Studies of HRM Strategies

A promising avenue for future study is the use of longitudinal studies to monitor the effects of HRM initiatives on employee happiness and retention over time. Researchers would be able to see patterns and trends in the data that would not be apparent in cross-sectional studies, and HRM techniques' efficacy over time would be better understood. A more complete picture of how HRM techniques adjust to shifting corporate contexts could be provided by longitudinal research, which could also aid in addressing biases brought about by retrospective data.

In sum, this study sheds light on how human resource management tactics have changed over the years in different companies, with a particular emphasis on how changes in technology, concerns about workers' health, and generational dynamics have influenced current HR policies and procedures. However, additional study is required to expand upon these findings due to several limitations, such as data restrictions and the research's cross-sectional design.

The effects of new technology on HRM procedures, as well as cross-sector and cross-national comparisons, should guide future studies. Further investigation into topics like employee wellness, remote work, and diversity and inclusion is highly encouraged. Our knowledge of how human resource management methods affect employee happiness and retention in today's complicated and ever-changing corporate climate will only grow if these knowledge gaps are filled in by subsequent research.

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The influence of sensory marketing on the consumer buying process for online furniture

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Sensory Marketing, Consumer Decision Making, Online Furniture, Consumer Buying Process

Abstract

As e-commerce continues to grow, the online furniture market faces a significant challenge: customers can't physically touch or feel the products before buying them. This lack of sensory interaction makes it harder for consumers to evaluate furniture – an item where texture, appearance, and physical feel are traditionally key to the decision-making process. In response to this gap, sensory marketing has emerged as a powerful strategy to digitally recreate these sensory experiences and influence consumer behaviour online.

This study explores how sensory marketing affects the consumer buying process in the online furniture industry. It focuses on how digital sensory cues – like visuals, sounds, and imagined touch – can shape consumer perceptions, reduce uncertainty, and boost purchase intentions when physical contact with the product isn't possible.

*Through an in-depth review of existing literature, the research identifies ten key factors that consistently appear in studies on sensory marketing and online shopping behaviours: **trust, perceived usefulness, perceived ease of use, enjoyment, purchase intention, haptic imagery, product informativeness, attitude, auditory stimulation, and enhanced visual experience.** These factors formed the basis for a structured questionnaire designed to collect data from online furniture shoppers.*

The study is driven by four main objectives: (1) to examine how sensory marketing influences each stage of the consumer decision-making journey; (2) to pinpoint the most effective sensory cues in online furniture shopping; (3) to understand how these cues help reduce perceived risk and build consumer trust; and (4) to explore how digital platforms can simulate physical experiences to make up for the absence of touch. Ultimately, this research aims to offer practical insights into how sensory marketing can enrich the online shopping experience and help furniture retailers better connect with their customers.

Introduction:

Online shopping has revolutionized consumer purchasing behaviour, driven by advances in internet technology, widespread smartphone use, and evolving lifestyles. Its convenience, extensive product variety, and personalized experiences—especially accelerated during the COVID-19 pandemic—have made online retail increasingly dominant. However, challenges remain, such as concerns over trust, security, and the inability to physically examine products before purchase. To better understand these dynamics, researchers employ theoretical models like the Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), and Technology Continuance Theory (TCT), which emphasize factors such as perceived usefulness, ease of use, trust, social influence, and customer satisfaction.

One critical factor influencing online purchase behaviour is trust, which helps consumers overcome fears of fraud and uncertainty. Other important considerations include perceived risks, convenience, price comparisons, and access to detailed product information. Digital innovations like artificial intelligence enable personalized recommendations, while augmented reality tools simulate product experiences, particularly benefiting sectors like furniture retail, where tactile evaluation is traditionally vital. Additionally, loyalty programs, mobile commerce, social commerce, ethical consumption trends, and

voice assistants are reshaping the online shopping landscape, enriching consumer engagement and decision-making.

Sensory marketing – the strategic engagement of the five senses (sight, sound, touch, taste, and smell) to shape perception and influence consumer behaviour – has long been a powerful branding tool with roots in ancient cultures. While sensory marketing is well-established in physical retail environments, its application online poses unique challenges due to the absence of direct tactile and olfactory experiences. Consequently, online retailers rely heavily on high-quality visuals and videos to evoke emotional connections, build trust, and compensate for sensory limitations. Though research on digital sensory marketing is still developing, existing studies suggest that thoughtfully designed sensory cues can positively impact consumer perceptions and confidence, even when physical interaction is not possible. For example, when purchasing products like milk or fresh fruit online – where taste and smell are inaccessible – consumers depend heavily on visual appeal, brand reputation, and user reviews.

This study focuses on the intersection of sensory marketing and online consumer behaviour within the furniture market, a sector where sensory experience traditionally influences purchase decisions. The research aims to: (1) evaluate the influence of sensory marketing across different stages of the consumer decision-making process in online furniture shopping; (2) identify which sensory cues most significantly impact consumer choices; (3) assess how sensory marketing can mitigate perceived risks and build trust in the absence of physical product interaction; and (4) explore how digital platforms can effectively simulate sensory experiences to overcome the lack of tactile feedback. By addressing these objectives, the study seeks to bridge gaps in existing literature and offer insights that help businesses enhance digital shopping experiences through effective sensory marketing strategies.

Methods

The researchers have followed a specific procedure in this study to achieve the objective.

Research Objectives

After a thorough review of existing literature on sensory marketing and online furniture, the researchers identified a significant research gap. This gap has led to the formulation of the following research questions and objectives, respectively, to guide further investigation:

1. How does sensory marketing impact the consumer decision-making process in the online furniture market?
2. What specific sensory cues are most effective in influencing consumer buying decisions when purchasing furniture online?
3. How does the inability to physically feel the product in online furniture shopping impact consumer trust and purchasing decisions?
4. In what ways do online furniture retailers compensate for the lack of tactile feedback to communicate product quality?

Research Objectives

1. To evaluate the influence of sensory marketing on different stages of the consumer decision-making process in the online furniture market.
2. To identify the sensory cues that have the greatest impact on consumer decision-making when purchasing furniture online.
3. To assess the role of sensory marketing in mitigating perceived risk and building trust in online furniture shopping.
4. To investigate how digital platforms can use sensory marketing techniques to simulate physical sensory experiences to compensate for the lack of tactile feedback.

This study aims to develop a conceptual framework that identifies the key factors in sensory marketing and online furniture.

Search Strategy

- Databases Used: Scopus, Web of Science, Google Scholar, ResearchGate
- Keywords: Sensory Marketing, Consumer Decision Making, Online Furniture, Consumer Buying Process

- Papers Included: Recent studies from the last 5–10 years, theoretical papers, Empirical studies, peer-reviewed journal articles,
- Excluded: government reports, conference proceedings, book chapters, abstracts, editorials, theses, and duplicate records. The review also omitted studies focused solely on offline environments or unrelated sectors, such as automotive or food and beverage, unless those studies offered meaningful insights into online sensory experiences relevant to the furniture industry

Literature Review

Introduction to Sensory Marketing

For many years, marketers have encouraged consumers to visualize the use of their products. According to Krishna (2010), sensory marketing is defined as 'marketing that engages the consumers' senses and influences their behaviour's.' This definition can be expanded to suggest that sensory marketing encompasses 'marketing that engages the consumers' senses and influences their perception, judgment, and behaviour' (2018). Marketers and advertisers have employed Sensory Marketing (SM) due to its significant impact on Consumer Behaviour. The senses have been referenced in ancient texts and scriptures across various cultures, civilizations, and religions, with detailed discussions of the five senses, known as the indriyas or sense organs, in Hindu scriptures (Mamidi & Gupta, 2018). Buddhism also emphasizes the importance of the five senses, referred to as dbang po (Holba, 2019). From the ancient Greek civilization (Jennifer, 2017) to the Maya civilization, the senses have been extensively documented in their texts as a means of communication with the external world (Houston & Taube, 2000). Marx's writings introduce the concept of the 'Human Sense,' which integrates all five senses, highlighting the multisensory aspect (Mamidi & Gupta, 2018). The domain of sensory marketing has garnered significant attention from researchers, resulting in a notable increase in publications in this area over recent years. Consequently, there is a growing interest from both the marketing and academic communities in sensory marketing. Nevertheless, the field of sensory marketing is extensive and diverse, encompassing studies that focus on the senses and their integration (Krishna, 2012a), the application of sensory marketing in advertising (Krishna et al., 2016), the influence of one sense on another (Krishna & Morrin, 2008), their interactions (Krishna, 2006), and their effects on consumer behaviour (Helmefalk, 2019; Balaji et al., 2011), among other topics. Sensory marketing is a rapidly developing yet fragmented field, posing challenges for researchers seeking a cohesive and objective overview.

Key Elements of Sensory Marketing

The five senses – sight, sound, touch, taste, and smell – play distinct yet interconnected roles in shaping consumer experiences. Scholars have extensively studied each sensory dimension, often highlighting how a multi-sensory approach generates greater emotional responses and deeper brand relationships (Krishna, 2012; Hultén, 2015).

✓ **Sight:** Visual elements are perhaps the most heavily utilized in marketing, given the dominance of vision in human perception. Colors, shapes, and design significantly influence brand recognition, product evaluation, and mood (Labrecque et al., 2013).

✓ **Color Psychology:** Different colors evoke different emotional reactions; for instance, red can stimulate appetite while blue conveys trust and calmness (Labrecque & Milne, 2012).

Packaging and Store Design: Visual aesthetics can enhance perceived product quality and brand image (Spence et al., 2014).

✓ **Sound:** Sound includes music, brand jingles, and ambient noise. Research shows that background music tempo and genre can influence shopping pace and product preferences (Biswas et al., 2019).

Background Music: Slow music leads to longer shopping times and higher spending (Milliman, 1982; recent updates by Garlin & Owen, 2016).

✓ **Sonic Branding:** Unique auditory logos (e.g., McDonald's 'I'm Lovin' It') reinforce brand identity (Krishna, 2012).

✓ **Smell:** Olfactory stimuli are powerful triggers of emotion and memory. Pleasant scents can create positive evaluations of retail environments and even enhance the perceived value of products (Krishna et al., 2016).

✓ **Ambient Scent:** Subtle use of scent in stores has been linked to increased dwell time and sales (Spence et al., 2014).

✓ **Taste:** Taste is particularly significant in the food and beverage sector but increasingly leveraged across other domains through product sampling and experiential marketing (Krishna, 2012).

✓ **Food Sampling:** Experiential marketing strategies use taste to build emotional connections (Hultén, 2015).

✓ **Touch:** Tactile sensations significantly impact product perceptions, especially regarding quality and value.

✓ **Haptic Imagery:** Even in online contexts, encouraging consumers to imagine touch can enhance product attractiveness (Peck & Childers, 2018).

Consumer Buying Process:

Consumer behavior encompasses the thoughts, emotions, and actions individuals experience during the consumption process (Peter & Olson, 1987). In the realm of online shopping, consumers have the ability to select from a vast array of products that can be customized according to various criteria, ranging from sneakers to computers. This behavior is shaped by underlying values, motives, and attitudes, which are reflected in purchasing decisions. Shopping motivations can be categorized as either hedonic or utilitarian, with both types of values receiving significant attention in research (Kesari & Atulkar, 2016). The swift evolution of e-commerce has revolutionized consumer interactions with products, particularly in sectors where sensory experiences have historically been vital, such as furniture retail (Petit, Velasco, & Spence, 2019). Sensory marketing, which aims to sway consumer perceptions and actions through sensory engagement, has emerged as a crucial tactic for online furniture retailers striving to mitigate the challenges posed by the digital landscape (Kothari & Sharma, 2024). This literature review examines the consumer purchasing process, contrasts the dynamics of online and offline shopping, analyzes the impact of sensory marketing at each stage, and identifies key factors influenced by sensory strategies, drawing on recent academic research from 2015 to 2025.

Consumer Buying Process: Concept and Stages

The consumer buying process typically involves five stages: problem recognition, information search, evaluation of alternatives, purchase decision, and post-purchase behavior (Kotler & Keller, 2016).

- **Problem Recognition:** The realization of a gap between a desired and actual state, often triggered by internal stimuli (e.g., needs) or external stimuli (e.g., marketing campaigns).
- **Information Search:** Consumers seek internal (memory) and external (online reviews, advertisements) information to resolve their needs.
- **Evaluation of Alternatives:** Consumers assess different products/brands based on attributes like price, quality, or brand reputation (Jain & Chaudhary, 2024).
- **Purchase Decision:** After evaluating, consumers select the most suitable option.
- **Post-Purchase Behavior:** Consumers reflect on their decision, leading to satisfaction (positive reinforcement) or dissatisfaction (leading to cognitive dissonance).

Recent studies emphasize that online environments complicate the buying process, especially in furniture retail, where consumers traditionally rely heavily on haptic (touch) and spatial perception (Petit et al., 2019).

Consumer Buying Process: Online vs. Offline Context

The way consumers make buying decisions—from realizing they need something to actually purchasing it and reflecting afterward—can look very different depending on whether they're shopping online or in a physical store. When we look at this through the lens of sensory marketing, these differences become even more noticeable.

In a traditional offline setting, shopping is a fully sensory experience. You can touch and feel the texture of a sofa, smell the fresh scent of new wood, see how colors look under store lighting, and even hear the ambient music that sets the mood. These sensory elements play a big role in making the experience enjoyable and help customers feel more confident in their choices. This is especially important in industries like furniture, where the “feel” of the product can heavily influence the final decision.

Online, however, things are different. The experience is mostly limited to what we can see on a screen and read in descriptions. Without the ability to touch or interact with a product physically, many consumers feel unsure or hesitant. To overcome this, online retailers are getting creative—using things like high-quality images, 360-degree views, augmented reality, and even sound-based product videos to mimic the in-store experience as closely as possible.

That’s why sensory marketing matters in both settings, but the approach changes depending on where the customer is shopping. Bridging that sensory gap online isn’t just a nice-to-have—it’s essential for building trust, creating a pleasant experience, and ultimately encouraging people to click “buy.”

Sensory Marketing: Online Furniture

Sensory marketing engages consumers' five senses to create immersive brand experiences (Krupka, 2023). For online furniture, the application focuses primarily on visual, auditory, and simulated tactile senses:

- Visual: High-definition photos, 360° rotating images, 3D models, AR visualization (Petit et al., 2019).
- Auditory: Background music in videos that conveys brand identity or emotional tone (Tokinomo, n.d.).
- Simulated Tactile: Descriptive words like "plush," "smooth," or videos showing product usage to hint at touch quality (Onobrakpeya, 2024).

While olfactory and gustatory senses are harder to engage online, sensory marketing compensates through mental imagery stimulation, where vivid descriptions trigger sensory memories (FasterCapital, n.d.)

Influence of Sensory Marketing on Each Stage of the Buying Process

- **Problem Recognition**

Visual stimuli, such as lifestyle imagery showing furniture in aspirational settings (beautiful living rooms, cozy bedrooms), create emotional triggers, helping consumers recognize latent needs (Agarwal, 2015; Tokinomo, n.d.).

Example: A consumer scrolling Instagram sees an image of a cozy reading nook and realizes the desire for a new armchair.

- **Information Search**

Detailed product descriptions, video demonstrations, customer reviews focusing on sensory experiences (e.g., "soft fabric," "sturdy feel") serve as crucial informational tools (Berčík et al., 2017).

AR technology, allowing virtual placement of furniture in home spaces, greatly aids information search by reducing uncertainty (Petit et al., 2019).

- **Evaluation of Alternatives**

Consumers rely heavily on multi-sensory clues when comparing alternatives online. For instance, higher-quality visuals or richer storytelling often translate into perceived product superiority (Krupka, 2023).

Jain and Chaudhary (2024) found that emotional resonance created through sensory cues can outweigh purely rational evaluations like price or specifications.

- **Purchase Decision**

Sensory engagement builds emotional confidence in the product, reducing hesitation and leading to quicker purchase decisions (Kothari & Sharma, 2024).

According to Onobrakpeya (2024), consumers exposed to multisensory cues reported higher purchase intentions and were more willing to pay premium prices.

- **Post-Purchase Behaviour**

Positive sensory impressions translate into satisfaction, repeat purchases, and brand loyalty (FasterCapital, n.d.). Conversely, if sensory expectations are unmet (e.g., product texture differs from online portrayal), consumers experience cognitive dissonance, leading to negative word-of-mouth (Petit et al., 2019).

Conceptual Framework/Model:

Technology Acceptance Model (TAM)

Originally developed by Davis (1989), the Technology Acceptance Model (TAM) has been extensively applied to online purchasing contexts. Hossain et al. (2023) demonstrated that perceived usefulness (PU) and perceived ease of use (PEOU) are critical drivers influencing a consumer's intention to shop online.

PU refers to the extent to which a consumer believes that using an online platform will enhance their shopping effectiveness, while PEOU denotes how effortless the shopping experience is perceived to be.

Recent research also integrates trust into TAM, recognizing that online transactions require a high degree of confidence in website security and vendor reliability (Gefen et al., 2017).

Unified Theory of Acceptance and Use of Technology (UTAUT and UTAUT2)

Developed by Venkatesh et al. (2003), the UTAUT model combines elements from eight different models, including TAM, TPB, and DOI. UTAUT suggests that performance expectancy, effort expectancy, social influence, and facilitating conditions impact technology acceptance.

In an e-commerce context, Martins et al. (2019) adapted UTAUT2 to include hedonic motivation (enjoyment derived from online shopping) and price value as critical predictors of online purchase intentions.

Technology Continuance Theory (TCT)

Liao et al. (2009) proposed the Technology Continuance Theory (TCT) to better explain not just initial adoption but the continued use of online services. TCT integrates:

- Attitudes
- Confirmation of expectations
- Satisfaction
- Perceived usefulness

This model is particularly useful for studying repeat purchases in online retail, which are critical for customer retention.

Model Proposed: The STS Model (SOR/TAM Blend)

In this conceptual paper, we propose a hybrid framework combining the Stimulus-Organism-Response (SOR) model and the Technology Acceptance Model (TAM) to study the influence of sensory marketing on the online furniture buying process. We refer to this integrated model as the STS Model (Stimulus-Technology-Response) – representing a nuanced approach to understanding consumer behaviour in digital environments.

Theoretical Foundation

SOR Model (Mehrabian & Russell, 1974):

- Stimulus (S): External cues from the environment (e.g., sensory stimuli such as visuals, sounds, interactivity).
- Organism (O): Internal states of the consumer (e.g., perception, emotions, cognitive processing).
- Response (R): Behavioural outcomes (e.g., purchase intention, engagement, satisfaction).

TAM Model (Davis, 1989):

- Focuses on the acceptance of technology through two key beliefs:

Perceived Usefulness (PU)

Perceived Ease of Use (PEOU)

- These influence attitude toward using the system and ultimately, behavioural intention.

Rationale for STS Integration

In online furniture retail:

- Consumers interact with **digital interfaces** (where TAM applies).
- Their behaviour is also influenced by **sensory elements** (captured via the SOR framework).
- Blending these models helps address both **technological** and **psychological** dimensions of the consumer journey.

STS Model Structure:

1. Stimulus: Product Informativeness, Enhanced Visual Experience, Haptic Imagery, Trust, Auditory Stimulation
2. Organism: Enjoyment, Perceived Ease of Use, Perceived Usefulness
3. Response: Purchase Intention, Attitude

Model Justification

The conceptual framework for this study is based on an integrated approach combining the Stimulus-Organism-Response (SOR) model and the Technology Acceptance Model (TAM), referred to here as the STS Model. This model is designed to explore how sensory marketing influences the online furniture consumer's decision-making process. The chosen variables are theoretically grounded in existing literature and adapted to suit the context of online furniture shopping – a high-involvement, sensory-dependent category.

Stimulus (S): External Sensory and Informational Inputs

These are the marketing-related cues delivered through digital platforms that trigger consumer cognition and affect:

- **Product Informativeness:** The extent to which product details, specifications, and content assist in decision-making. It reduces uncertainty and perceived risk, a key factor in online furniture purchases.
- **Enhanced Visual Experience:** High-resolution images, 360° views, and AR simulations enhance the visual appeal and allow consumers to simulate ownership or placement mentally.
- **Haptic Imagery:** Descriptive language and imagery that evoke the sense of touch – compensating for the inability to interact with the product physically.
- **Trust:** Confidence in the platform, brand, and product representation, which acts as a key sensory and emotional stimulus in e-commerce.
- **Auditory Stimulation:** Video content with voiceovers or ambient sound can improve engagement and enhance the sensory experience.

These stimuli aim to recreate a multisensory retail experience in the online space, stimulating deeper involvement with the product.

Organism (O): Internal Psychological States

These represent the cognitive and affective reactions evoked by the stimuli, which influence behavioural outcomes:

- **Enjoyment:** A hedonic response indicating the emotional pleasure derived from interacting with the online content.
- **Perceived Ease of Use (PEOU):** A TAM construct indicating how effortless the user finds the website or shopping interface.
- **Perceived Usefulness (PU):** Another TAM construct that assesses how well the interface and sensory content assist in making informed purchase decisions.

These internal states mediate the relationship between stimuli and final behaviour, shaping how the consumer interprets and responds to sensory inputs.

Response (R): Behavioural Intentions and Attitude

The final stage captures the consumer's resultant attitudes and intended actions:

- **Purchase Intention:** The likelihood of the consumer completing the furniture purchase based on their internal responses to sensory cues.
- **Attitude:** The overall evaluative judgment toward the product or platform, influenced by both emotional enjoyment and perceived usefulness.

These outcomes are the result of a successful interaction between sensory marketing and the user's psychological processing.

Summary

By combining SOR's environmental psychology focus with TAM's technology acceptance insights, the STS Model offers a robust framework to study how digital sensory cues (stimuli) affect the consumer's internal states (organism), ultimately shaping online buying behaviour (response). It is especially suited to online furniture retail, where tactile and spatial perceptions are critical yet difficult to replicate in virtual environments.

This framework provides both theoretical depth and practical relevance, offering a foundation for future empirical validation.

Quantitative Analysis (Pilot Study)

To support the development of the proposed conceptual framework, a pilot study was conducted involving a sample of 50 participants. The primary aim of this pilot was to assess the clarity, structure, and initial reliability of the questionnaire, as well as to evaluate the feasibility of the research model before proceeding to full-scale data collection.

The questionnaire was structured to measure key constructs derived from the conceptual model, including perceived usefulness, trust, haptic imagery, perceived enjoyment, attitude, product informativeness, auditory stimulation, enhanced visual experience, and purchase intention. All constructs were measured using previously validated Likert-scale items, adapted to suit the online furniture shopping context.

Although a comprehensive statistical analysis is yet to be conducted, the preliminary data collection provided valuable insights. Initial reviews of the responses indicated that participants understood the questions clearly, and no major issues were reported regarding ambiguity or item confusion. This reinforces the appropriateness of the instrument for the target population.

Descriptive statistics and internal reliability will be computed in the next phase to confirm the reliability and consistency of the scales. The pilot study thus serves as a foundational step for refining the instrument and validating the structure of the proposed model, which will be tested through the databases and software's once a larger sample is obtained.

In summary, the pilot study contributes to the conceptual paper by ensuring that the instrument is both methodologically sound and contextually relevant, laying the groundwork for rigorous empirical testing in the subsequent stages of research.

Conclusion and Future Implications

The proposed STS Model introduces a novel interdisciplinary framework that contributes to the theoretical advancement of research in digital consumer behaviour, sensory marketing, and technology acceptance. It offers scholars a new lens to explore how sensory cues influence online purchasing decisions, particularly in sensory-dependent product categories such as furniture, apparel, luxury goods, and home décor. From a practical standpoint, online furniture retailers can leverage these insights to create more immersive and engaging shopping experiences by incorporating technologies like augmented reality (AR), virtual reality (VR), rich visual storytelling, and sensory-rich video content. Such strategies have the potential to build greater consumer trust, enhance engagement, and drive higher conversion rates. Furthermore, as consumers increasingly depend on digital cues in the absence of physical touch, the integration of sensory marketing becomes critical in reducing perceived risk and enhancing post-purchase satisfaction—especially for high-involvement purchases. This paper also lays the groundwork for future empirical research to validate the STS Model using quantitative methods such as structural equation modelling, or experimental designs across diverse demographics and cultural settings. Longitudinal studies could further investigate how digitally simulated sensory experiences influence long-term consumer loyalty and retention in e-commerce. In summary, this study bridges an important gap at the

intersection of sensory marketing, consumer psychology, and digital technology. By addressing how the sensory limitations of online environments can be mitigated through strategic design and innovation, the paper contributes both theoretical insight and practical guidance for researchers and e-retailers alike.

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The relationship between student debt and academic performance at the University of Cape Town, South Africa

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Keywords

Academic performance; Correlation; Higher education; South Africa; Student debt; University of Cape Town

Abstract

Student debt's impact on academic performance remains under-researched, particularly in South Africa. This study investigates the correlation between student debt and GPA among undergraduates at the University of Cape Town (UCT), South Africa from 2021-2023. Employing a cross-sectional correlation-based design, debt balances and GPAs for 13,580 students were analysed. A weak, negative correlation was observed between total student debt and GPA, suggesting higher debt is associated with lower academic performance. However, a strong negative correlation emerged within a specific overpayment band, indicating a potential link between substantial overpayments and improved GPA. These findings highlight the complex relationship between student debt and academic performance. Further research incorporating demographic and socioeconomic factors is crucial to fully understand these dynamics.

1. Introduction

The escalating burden of student debt has become a global concern, increasingly recognized for its potential impact on students' academic journeys and overall well-being. This financial strain is particularly pronounced in South Africa, where historical inequalities and socioeconomic disparities continue to shape the educational landscape. While access to higher education has expanded through initiatives like the National Student Financial Aid Scheme (NSFAS), significant challenges remain, including high attrition rates and persistent performance gaps. These challenges are further compounded by factors such as language barriers, with English being the primary language of instruction at most tertiary institutions despite its limited use in many households.

While research has explored the influence of race, language, and socioeconomic background on academic performance, the specific relationship between student debt and academic success in South Africa remains under-researched. This study aims to address this gap by investigating whether a correlation exists between student debt and academic performance among undergraduate students at the University of Cape Town (UCT). Utilising a quantitative approach, this research analyses UCT student debt balances and GPA scores to determine the strength and direction of their relationship. The findings of this study will contribute to a deeper understanding of the factors influencing student success in South Africa and inform the development of targeted support programs.

2. Literature review

2.1. South African student debt history

The student debt crisis in South Africa stems from the country's history of racial segregation (Bozalek & Boughey, 2012). Prior to 1994, access to higher education was racially restricted, resulting in very low participation rates for Black and Coloured South Africans (9% and 11% respectively), despite making up over 80% of the population (Sehoole & Adeyemo, 2016). Post-apartheid, participation from these groups increased dramatically to over 80% over three decades. However, this increased access coincided with rising higher education costs and insufficient government funding, creating a significant rise in student debt (Wangenge-Ouma & Cloete, 2009).

Student protests and the National Student Financial Aid Services

The #FeesMustFall protests in South Africa highlighted the student debt crisis, emphasizing how rising higher education costs and insufficient government funding limited access and social mobility for disadvantaged students (Yaskowski, 2020). In 2017, free tertiary education was introduced for households earning under R350,000 annually, converting National Financial Aid Services (NSFAS) loans into bursaries (Griffiths, 2019). However, this policy created a “missing middle” – students from households earning between R350,000 and R600,000 who could not afford tuition but did not qualify for NSFAS funding. Programs like the Ikusasa Student Financial Aid Programme (ISFAP) aimed to bridge this gap, but funding constraints remained (Chetty, 2017).

Research on NSFAS and academic performance suggests that financial aid alone does not guarantee success. Studies found that even funded students struggled to complete their degrees on time, highlighting the need for wrap-around support, such as mentorship, academic assistance, and mental health resources (Carpenter & Roos, 2020). Despite the presence of such programs, like the Thuthuka Bursary Fund, challenges like mental health issues and poor study habits still led to student dropouts (Ontong & Smit, 2023).

2.2. Theoretical framework

This study draws upon Astin's Input-Environment-Outcome model as a framework for understanding the complex interplay of factors influencing student success. The IEO model posits that student outcomes (e.g., academic performance, persistence) are a function of student inputs (e.g., pre-university characteristics, academic preparedness) and the university environment (e.g., curriculum, peer interactions, institutional resources) (Astin, 1993). Within this framework, student debt can be conceptualised as an environmental factor that may significantly impact student success. Specifically, high levels of student debt could create a stressful environment, diverting students' time and energy away from academic pursuits and towards financial concerns. This financial strain could manifest in reduced engagement with coursework, decreased participation in extracurricular activities, and increased psychological distress, all of which could negatively impact academic performance. Conversely, manageable levels of student debt, particularly when coupled with adequate financial literacy and support services, might motivate students to perform well academically in order to secure future employment and repay their loans. This study aims to investigate the nature and strength of this relationship between student debt as an environmental factor and academic performance as an outcome within the South African higher education context.

2.3. Measuring academic success

Academic performance is commonly measured by GPA scores due to their objectivity and suitability for quantitative studies. However, some researchers argue for broader measures, including resilience, self-authorship, and preparedness for post-graduate life. Despite these arguments, GPA remains the most prevalent metric in the literature (York et al., 2015).

2.4. Student debt

Research on student debt and academic performance often considers broader factors like motivation, mental health, and well-being. While Western contexts, especially the US, dominate this research area, studies vary in approach.

2.4.1. Lower debt levels: Minimal or no impact

Studies suggest that lower levels of student debt may not significantly impair academic performance. For instance, access to moderate student loan amounts can facilitate educational attainment without negatively affecting GPA or persistence rates (D. J. Baker & Doyle, 2017; Denning & Jones, 2019). In some cases, lower debt levels may even incentivise students to perform better academically, as the financial burden is manageable and does not distract from studies (Schmeiser et al., 2015).

The manageable nature of smaller debts often leads to reduced financial anxiety, allowing students to allocate more cognitive resources to their academic work, thereby potentially enhancing their focus and overall academic achievement (Gervais & Ziebarth, 2017).

2.4.2. *Higher debt levels: Negative correlations*

However, the picture changes with higher levels of debt. Multiple studies have found that students with larger debt burdens tend to have lower GPAs, reduced credit hour accumulation, and lower retention rates (Bårdsen et al., 2023; Stoddard et al., 2018). For example, one study revealed that students with debt balances between \$10,001 and \$20,000 had a 13.7 percentage point lower likelihood of achieving a GPA above 3.5 compared to students without debt (Bårdsen et al., 2023). Similarly, another study found that higher debt levels were associated with fewer credits taken per semester and lower academic performance overall (Stoddard et al., 2018).

2.4.3. *Threshold effects*

Research also points to the existence of a debt threshold beyond which academic performance begins to decline. For instance, one study identified that debt levels exceeding \$10,000 negatively impacted college completion rates, particularly for students from lower-income backgrounds (Dwyer et al., 2012). This suggests that while some debt can be beneficial or neutral, excessive debt becomes a barrier to academic success.

2.4.4. *Indirect impact of debt*

Studies have shown that financial stress, mental health and attitude affected by debt impact performance. Financial stress reduces students' motivation, goal commitment, and academic engagement (A. R. Baker & Montalto, 2019; Destin & Svoboda, 2018). For example, experimental manipulations that highlight financial burdens have been shown to directly impair students' cognitive functioning, particularly when financial stress creates an identity conflict or perceived barrier to future success (Destin & Svoboda, 2018).

Medical students experience high levels of debt-related stress (increased number of years for their studies), which is correlated with poorer mental health, lower academic performance and career choices based on financial considerations rather than personal preference (Pisaniello et al., 2019; Yang et al., 2024). Similarly, non-white students and those from underrepresented minorities often face compounded financial stress, which can further exacerbate academic challenges (Bui, 2024).

Interestingly, some studies suggest that students' attitudes toward debt can mediate the relationship between debt levels and academic outcomes. Students who are more tolerant of debt may perform better academically despite accumulating more debt, while those who are debt-intolerant may experience poorer outcomes (Zhang & Kemp, 2009).

The literature also indicates that first year students who accumulate debt perform worse academically, in Australia and New Zealand (Birch et al., 2006; Zhang & Kemp, 2009). Other studies highlight the snowball effect of student debt, where undergraduate loans lead to further borrowing for postgraduate studies, increasing overall debt (Webber & Burns, 2022).

In South Africa, the focus has primarily been on NSFAS and its role in the student debt crisis. Research indicates a weak but statistically significant positive correlation between NSFAS funding and average academic performance when controlling for other variables (Wildschut et al., 2020). A study found that larger NSFAS awards are associated with improved student performance, particularly at historically black institutions (Pillay et al., 2021). Conversely, an older study with 2011 data investigated the relationship between funding and academic performance and found no relationship between being awarded a bursary and successful graduation (Naidoo & McKay, 2018). However, there are challenges associated with NSFAS funding implementation and issues such as mismanagement and corruption within NSFAS may hinder its effectiveness, impacting overall student success despite the funding provided (Matyana et al., 2023).

Student debt is not the only variable impacting academic performance. A significant body of research has formed around this topic both globally and in South Africa.

2.5. Other factors affecting determinants of success

The single best predictor of academic performance at all levels for accounting students in South Africa is prior academic performance (Bokana & Tewari, 2014; Jansen & De Villiers, 2016; Papageorgiou & Carpenter, 2019). Performance in Grade 12 is strongly correlated with academic success at all levels of tertiary education.

Evidence is inconclusive regarding age and gender and performance. Some studies indicate younger students outperform older students (Bokana & Tewari, 2014; Jansen & De Villiers, 2016), while the contrary was found at the beginning of an undergraduate degree (Papageorgiou, 2017). The impact of gender on academic performance remains uncertain, with studies yielding mixed findings. Some studies indicate male outperformance (Jansen & De Villiers, 2016), while others the opposite in undergraduate studies (Carpenter & Kunaka, 2018). Research shows that female students generally outperform male students in graduation rates, despite experiencing higher stress levels (Frazier et al., 2019). However, male students demonstrate greater self-efficacy, which has been linked to better academic outcomes in accounting (Carpenter & Shamsoodien, 2021; Lin et al., 2023).

Students from affluent backgrounds (quintile 4–5 schools, fee-paying and with less government support) tend to be better prepared for university due to greater educational resources and cultural capital (Thomas & Maree, 2022). While some studies dispute the direct impact of school type on academic performance, inadequate preparation is linked to higher dropout rates (Mtshweni, 2022).

Studies from Brazil, South Africa, and the U.S. suggest that students from historically disadvantaged racial groups tend to perform worse academically than their White counterparts (Marshall, 2021; Papageorgiou, 2017). Contributing factors include socio-economic inequalities, academic preparedness, stress, and mental health. In South Africa, racial disparities are further complicated by the country's socio-economic history. The research clearly indicates White students tend to achieve higher academic outcomes compared to other racial groups, with Black students facing lower pass rates, and Black African students experiencing the greatest challenges. Although access to tertiary education and financial support has expanded, student attrition rates remain significant (Kaburise, 2014).

Linked to the impact of race on performance, English is the primary language of instruction at most tertiary institutions in South Africa, although few households speak English at home. Non-native English speakers face additional academic challenges, impacting their performance (Joynt, 2023). While some literature notes a strong positive correlation between academic success and assessment in one's first language (Bokana & Tewari, 2014; Swart & Becker, 2014), this is not necessarily linked to Grade 12 language results (van Rooy & Coetzee-van Rooy, 2015).

Due to the scant research on student debt and performance in South Africa, it is worthwhile first exploring if there is a relationship between student debt and academic performance in South Africa, and thereafter to investigate the extent and depth of that relationship.

3. Methodology

The objective of this study was to identify whether a relationship exists between student debt and academic performance. The students investigated were those registered at the University of Cape Town over the three year period 2021 to 2023.

Student debt was measured by student debt balances, obtained from UCT's Finance Department, while academic performance was measured by GPA, obtained from UCT's Institutional Planning Department. The final sample of students, after data cleaning, amounted to 13,580 (representing 15.3% of the 88,626 population). The main three reasons (accounting for 83.7% of the population) for the large reduction from population to sample was that 1) only final year students had calculated GPAs, 2) international students were excluded and 3) incomplete observations were removed. The sample was representative of the population across all of race, gender, language, Grade 12 performance and school quintile.

Student debt was also disaggregated into debt balances with R60,000 intervals, determined by using two standard deviations of the debt balance variable. Additionally, the -R60,000 to R0 range was changed to -R60,000 to R0.99, as debt balances below R1 would not ordinarily count as debt. The notable feature of overpayment arises when bursary funders pay UCT their budgeted amounts for student fees (but which

are more than UCT charges) and when students are awarded multiple funding awards in excess of fee cost.

The study employed a cross-sectional correlation-based research design. The data obtained was continuous for both debt and performance. Therefore, a two-tailed Pearson's correlation test – a parametric measure of the strength and direction of the correlational relationship – was calculated using IBM SPSS Statistics version 30. The test was performed for each of the R60,000 intervals per year, as well as for the sample as a whole.

4. Findings, results and discussion

A Pearson's two-tailed correlation was run to determine the relationship between student debt and academic performance amongst the 13,580 students. Results are displayed in Table 1. For the whole sample and at a total debt level, a weak, negative correlation exists that is statistically significant ($r=-0.156$, $p<0.001$). Increases in student debt are correlated with decreases in academic performance. This is supported by past studies (Bårdsen et al., 2023).

Table 1. Pearson correlation co-efficient (r) with p -values.

	2021 Sample	2022 Sample	2023 Sample	Total Sample
Sample size	4,510	4,359	4,711	13,580
(300 000) - (240 001)	0	0	0	1,000 ($p<.001$)
(240 000) - (180 001)	0	-1.000 ($p<.001$)	-0,996 ($p=.056$)	-0,973 ($p<.001$)
(180 000) - (120 001)	0	-0.821 ($p=.179$)	0,163 ($p=.613$)	0,003 ($p=.992$)
(120 000) - (60 001)	0.052 ($p=.777$)	0.237 ($p=.177$)	0,015 ($p=.924$)	0,085 ($p=.379$)
(60 000) - 0.99	0.008 ($p=.654$)	0.086 ($p<.001$)	0,038 ($p=.026$)	-0,166 ($p<.001$)
1 - 60 000	-0.081 ($p=.048$)	-0.268 ($p<.001$)	-0,140 ($p<.001$)	-0,155 ($p<.001$)
60 001 - 120 000	-0.046 ($p=.63$)	-0.141 ($p=.155$)	0,101 ($p=.272$)	-0,022 ($p=.694$)
120 001 - 180 000	0.076 ($p=.534$)	-0.081 ($p=.537$)	-0,080 ($p=.451$)	-0,043 ($p=.525$)
180 001 - 240 000	-0.023 ($p=.936$)	0.260 ($p=.23$)	-0,013 ($p=.95$)	0,190 ($p=.136$)
240 001 - 300 000	0	0.547 ($p=.262$)	-0,458 ($p=.438$)	-0,051 ($p=.876$)
300 001 - 360 000	0	0	-1,000 ($p<.001$)	-0,823 ($p=.385$)
Total debt level	-0.152 ($p<.001$)	-0.138 ($p<.001$)	-0.174 ($p<.001$)	-0.156 ($p<.001$)
Positive debt balance	-0.185 ($p<.001$)	-0.184 ($p<.001$)	-0.215 ($p<.001$)	-0.196 ($p<.001$)
Negative debt balance	-0.030 ($p=.392$)	0.004 ($p=.908$)	0.001 ($p=.965$)	-0.009 ($p=.633$)

Bolded correlation co-efficients and p -values are statistically significant.

Source: Authors' own construct

Disaggregating by years, the results remain similar. For each of 2021, 2022 and 2023 a statistically significant, weak, negative correlation exists. When each of the levels of student debt were correlated with the respective GPA scores at those levels, the results for the total sample show that the -R60,000 to R0.99 band ($r=-0.166$, $p<0.001$), the R1 – R60,000 band ($r=-0.155$, $p<0.001$) and the R480,001 to R540,000 band ($r=-1$, $p<0.020$) mimicked the correlation test results of the entire sample in strength and direction. The association between student debt and lower academic performance corroborates past research (A. R. Baker & Montalto, 2019; Bårdsen et al., 2023; Zhang & Kemp, 2009). The results are in contradiction to the view that lower levels of debt do not affect academic performance (D. J. Baker & Doyle, 2017; Denning & Jones, 2019; Schmeiser et al., 2015), as the findings for the total sample are significant only at the lower level of debt. To be explicit, these results indicate that increased levels of debt is not significantly related to academic performance, in contrast with past research (Bårdsen et al., 2023; Stoddard et al., 2018).

Interestingly, the -R240,000 to -R180,001 band ($r=-0.973$, $p=0.001$) revealed a statistically significant, strong, negative correlation between student debt and academic performance. This is counter to expectations.

At an overpayment level, this band suggests for the most part that an overpayment was associated with an increase in academic performance at UCT. This is to be expected, as overpayments can occur either from bursars or from awards given to the student. This type of student in their final undergraduate year would be expected to be academically strong. It is interesting this did not occur in all the overpayment bands.

It is notable that the total sample band -R60,000 to R0.99 band swung from a weak, negative correlation to a weak, positive correlation. This finding was significant for the 2022 ($r=0.086$, $p<0.001$) and 2023 ($r=0.038$, $p=0.026$) academic years. Surprisingly, the total sample had a weak, negative correlation ($r=-0.166$, $p<0.001$). One wouldn't expect an overpayment to be associated with lower academic performance. However, it must be noted that this band, for the vast majority, was made up of balances between R0 and R0.99.

5. Conclusion

This study investigated the relationship between student debt and academic performance among students at the University of Cape Town from 2021 to 2023. The findings revealed a statistically significant, weak, negative correlation between student debt and academic performance for the entire sample, indicating that increased student debt is associated with decreased academic performance, aligning with previous research (Bårdsen et al., 2023). The study's disaggregated analysis by year also revealed similar results, with each year (2021, 2022, and 2023) showing a statistically significant, weak, negative correlation.

These findings have implications for universities and policymakers in South Africa. Understanding all the factors influencing students' academic success in higher education is crucial. Awareness of these factors will enable universities to support students in developing effective learning strategies, ultimately enhancing their academic performance. Research on the impact of student debt (excluding NSFAS) in South Africa remains in its early stages.

While the study suggests a negative association between student debt and academic performance, it is important to consider the limitations of the study. Firstly, this study is confined to one large contact (face-to-face) higher education institution and may not be generalisable to other institutions in South Africa. Secondly, the study did not consider other factors that may influence academic performance, such as race, gender, school quintile, school-leaving marks, mental health, poverty, students' metacognition, academic preparedness and cultural capital.

Future research could focus on conducting a longitudinal study to examine a potential causal relationship between student debt and academic performance, as alluded to in Bårdsen et al. (2023). Additionally, future studies could consider the impact of the factors not investigated in this study. It would also be worthwhile to compare these results to those of other higher education institutions in South Africa.

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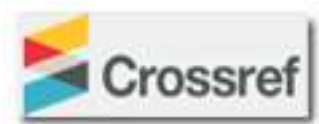
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