# Multiple linear regression analysis for determining factors affecting the actual adoption of enterprise application architecture for supply chain management

**Kingston Xerxes Theophilus Lamola**
University of Limpopo, South Africa

*Abstract*

*Background: In this study, Multiple Linear Regression (MLR) is cast-off a statistical technique accustomed to propositions on determining the nexus between internal dynamic exasperations (IDEs) and external dynamic exasperations (EDEs), denoted as the independent variables ($X_s$), as well as perceived attitudes signified as the predictor variable for actual adoption (AA) of enterprise application architecture (EAA), presented as the dependent variable (Y).*

*Objective: The objective of this paper was to ascertain the alternative hypotheses that IDEs, EDEs, and perceived attitudes (PAs) affect the AA of EAA for supply chain management (SCM) within small and medium enterprises (SMEs).*

*Design/Methodology: The study used quantitative analysis chronicled in statistical package social science (SPSS) version 25 that encompassed diagnostic tests through Cronbach's Alpha for reliability, and Double-Exponent Distribution for data validity. Data analysis is concerted through the model summary, graphical expression of MLR, regression analysis (algebra expression), along with Beta weight.*

*Results/Findings: A stratified-random sampling of 310 data sets were used as SMEs' owners and managers. The results were obtained from the main analysis of multiple regression that produced a model equation (Y) that determined the estimations of AA of EAA with 5xs; 19.49x6; 17.84x6; 18.23x6; 16.12x6; and 9.82x6; and response variable (Y); 25.8 x6: wherein $\varepsilon_i$ is residual error.*

*Practical implications and conclusions: This exertion contributes to existing knowledge on AA of EAA for SCM by providing three main separable functions of multilinear regression (MLR). First, it broadens the understanding of the strength of relationships between $X_s$, PV and Y. Second, its expositions which predictors in the model are statistically significant and which are not. Third, it projects a confidence interval for each predicted regression coefficient.*

## Introduction

MLR is performed for determining the level of connexions amongst IDEs, EDEs, and PAs having cost-effect relations for the AA of EAA. When SMEs are underdeveloped, they endure great hardships and exacerbate IDEs, EDEs and PAs towards SCM activities. Subsequently, they have marginal expertise in the Forth Industrial Revolution (4IR). Nevertheless, all the above variables have major disadvantages for 4IR, to list a few; exposure to cyber security risks, major industry disruptions and ethical concerns Firican (2020). Superfluously, as the supply chain (SC) pressures increase, it will probably be difficult for SMEs to adsorb three institutional isomorphic pressures on governance, customers, and suppliers expectations as dominant competitive pressures. It has usually been assumed that the AA of EAA is anticipated as models for easing the daily routines between internal and external stakeholders Zachman (2008); Tupper (2011) and Yang, Avgeriou, Liang & Eliasson (2017). Strategies to heighten AA of EAA might involve distributor automation, electronic data interchange and product code, data architecture, enterprise application integration, and online analytic algorithms, business strategy challenges, as affirmed by Gillin (2020a), and Behara (2022).

The objective of the study is to ascertain the alternative hypotheses that IDEs, EDEs, and PAs affect the AA of EAA for SCM within SMEs. The hypotheses were described consequently as...

- $H_{a1}$ = "*There is a correlation between IDEs (OPIs, ERs, ISCs and EATs) (independent variables and predictor variable) and PAs towards the AA of EAA for SCM in SMEs*" (Indirect relationship).
- $H_{a2}$ = "*There is a correlation between EDEs and PAs towards the AA of EAA for SCM in SMEs*" (Indirect relationship).
- $H_{a3}$ = "*There is a correlation between PAs and the AA of EAA for SCM in SMEs''* (Direct relationship).

Ortiz (2022) deliberates challenges and benefits of developing EAA. In his discussion, the benefits include easing business processes, marginalising costs, greater control of information, and encouraging collaboration and information exchange. Conversely, the challenges include scaling the business and changing environment, maximizing returns on investments, security, and control, user-friendly interface, engaging and training staff, storing large amounts of data, time and cost, upgrading legacy software, maintenance, in addition to third-party system integration. Nevertheless, this is the most inclusive description of dynamics that influence the AA of EAA, this study encompasses three variables: *First* - IDEs that include OPIs, ERIs, ISCs, and EATs. *Second* - EDEs, which include detailed elements such as: (a) complex legal and regulatory constraints, external financing, low technological capacity, relative advantage, traceability, compatibility of computer systems, and customizability of EAA to enterprise over and above external users. *Third* - PAs that includes alternative user-base solutions, technological aversion, and resistance to change.

However, these aspects are believed to be prompting IDEs, and EDs as revealed in several studies, to list a few, Suhadak and Mawardi (2017); Sherman (2018) and Hawks (2019). Subsequently, the statistical technique uses several explanatory variables to predict the outcome of a response variable. IDEs, EDs and PAs, are important components in the 4IR since they play a key role towards the AA of EAA. EAA has common myths anticipated with 4IR, perceived as a dynamic problems on exorbitant project to execute on application systems' multiplexes, not solving customer engagement, lack of understanding and expensive software applications in contrast to the economies of scale. On contrary, the benefits are the exact contrasting reflection of the myth stated in the previous sentence. The study attempts to aid SMEs in aligning internal operations with corporate strategy, tracking strategy implementation, and governing enterprise transformation.

## Literature Review
### *Theoretical review: Systems Theory Approach (STA)*

In the history of information technology (IT), the STA system has been thought of as a key factor in Health Sciences (Heylighen and Joslyn, 1992; Teenboom, 2018). Bertalanffy developed the theory via lectures in 1937 and then via publications in 1946 (Wilkinson, 2022). Okunbajo (2022) exemplifies dual version of the STA: *First:* Closed systems developed by Norbert Wiener and Ross Ashby in the modern version referred to as cybernetics. *Second:* Open system theory, proposed in the 1940s by biologist Ludwig von Bertalanaffy, who used the term general system theory to describe the main ideas and distinguish it from closed system thinking. Further, Rosh Ashby extended the theory to General Systems Theory (GST) in 1968.

In the context of this study, GST is defined as an extension of STA based on the assumption that complex systems share common organising principles that can be discovered and modelled mathematically (Proctor, 2015). STA is considered an interdisciplinary study of the non-figurative enterprise of phenomena independent of their nature, type, spatial or temporal scale (Heylighen and Joslyn, 1992). In simple terms, STA investigates both pros and cons of the AA of EAA, which are common to all complex enterprises with their different models for describing suitable algorithms. Gordon (2022) illuminates the key components for successful AA of EAA which includes inputs, transformational process, outputs, feedback mechanism, and the environment. Reflecting on the hypotheses posed at the beginning of this study, it is now possible to state that IDEs, EDs, and PAs play a significant role in the AA of EAA for SCM in SMEs.

*Assumptions on AA of EAA model built-up*

In the preceding studies, assumptions on TOGAF and EAA frameworks on the AA of EAA were established. On the same breath, for the AA of EAA, the process of model specification and parameter estimation was carried-out and sustained by three model descriptions. *First:* Zachman (2008) upholds that whether industries apply existing operations or build primitive models on the ontological, single-variable intersections between the interrogatives and the transformations or simply build ad-hoc, multi-variable, composite models made up of components of several primitive models. Likewise, in this study, the IDFs, EDFs, and predictor variables (PV$_s$) were used to test the response variable. *Second:* Tupper (2011) holds the interpretation that '*The Open Group Architectural Framework*' (TOGAF), and Architecture development method (ADM) has a genetic resemblance to the traditional waterfall-software development model.

The model is encompassed of phases such as planning, analysis, design, development, testing, and deployment, organised in sequential order. The EAA model of MLR is expressively not the same as those of AA of EAA in several key features, so is in different SMEs as per choice and preference. *Third:* The effectiveness of the EAA model has been exemplified in a report by Yang et al (2017), which includes four assumptions: *(a) Managerial assumptions* focused on project scope, quality, schedule, budget, resources, and risk. *(b) Organisational assumptions* built on artefacts defined by visible structures and processes; values that are grounded on espoused justifications that include strategies, goals, and philosophers. *(c) Technical assumptions* signifying any restriction on EAA choice regarding the design, implementation, or deployment of the solution. *(d) Technical assumptions* in many cases may be associated with certain principles defined in the enterprise architecture that restrict the types of platforms, programming languages, and decisions to buy or build part of the solution. Therefore, X$_s$, and PV$_s$ could be major factors, if not the only ones, causing assumptions on the AA of EAA.

## Systematic literature review (SLR)

Peričić and Tanveer (2019) implies SLR roles that examine and organise all relevant empirical evidence to provide a complete interpretation of research results. This study adopted a systematic literature review through a well-conceptualised literature review, which included summary table in line with authors, variables (IDEs, PAs, and AA of EAA), titles, aim\objectives, findings\results, and conclusions. SLR was synthesised using the same technique comprehensive for the AA of EAA, using multiple X$_s$. Furtheremore, some benefits of pursuing SLR include explicit and reliable methodology, precise outcomes, and comprehensive and exhaustive reproducible output.

In some instances, SMEs might face dynamic forces such as occupation generation, economic expansion, cumulative manufacturing output, enlightening the employees' expertise, intensification in exports, and advancing SMEs' SCM capability (Thompson, 2022). Therefore, being able to hypotheses the X$_s$, PV$_s$, and response variables more precisely to explore EAA, and identify hidden elements integrated with the algorithms. In addition, to structuring a successful EAA as per SMEs' specific needs and the type of internal and external integration that includes customer relationship management, customer service management, demand management, order fulfilment, manufacturing flow management, supplier relationship management, product development, and returns management (Badenhorst-Weiss, Cook, Heckroodt, Howell and Strydom, 2016).

Thriving, for a balanced EAA, the primary layers of web architecture such as the presentation layer, data service layer, business logic layer, and data access lay are significant (Bestaieva, 2021). Thriving, for a balanced EAA, the primary layers of web architecture such as the presentation, data service, business logic, and data access are insignificant (Bestaieva, 2021). An application architecture describes the patterns and algorithms used to design and build an application. In some instances, the web architecture provides SMEs with a roadmap and best practices to follow when building EAA for a well-structured configuration. Software design patterns could help SMEs to build a productive EAA. EAA in many instances may be associated with certain dynamics that influence application performance that might include application complexity, design, testing, butterfly effect, infrastructure and components for application service, network connectivity, the dynamic IT environment over and above virtualisation and cloud computing.

**Conceptual Literature Review**

In this study, a conceptual framework is described as a visual exemplification of the relationship between IDEs, EDEs, and PAs, which are grouped based on enterprise characteristics with the advantage of an existing literature review from prevailing studies and theories. Figure 1 illustrates multiple variables; $X_s$ as; IDEs and EDEs, $PV_s$ as PAs; and the response variables as AA of EAA. On completion of IDFs, EDFs, and PAs, the process of model description and constraint estimation is executed.

However, approach is in developing a model with known limitations such as (a) Isolation of the conceptual hypotheses from emerging literature review, compelling the researchers to restructure the model. (b) By stipulation a research hypothesis had more than one concept, the individual concepts had to be isolated and addressed. (c) Avoiding factual concepts as they might have several meanings that might derail the respondents as indicated in Annexure A - Summary table: IDEs, EDEs, PAs, and AA of EAA.
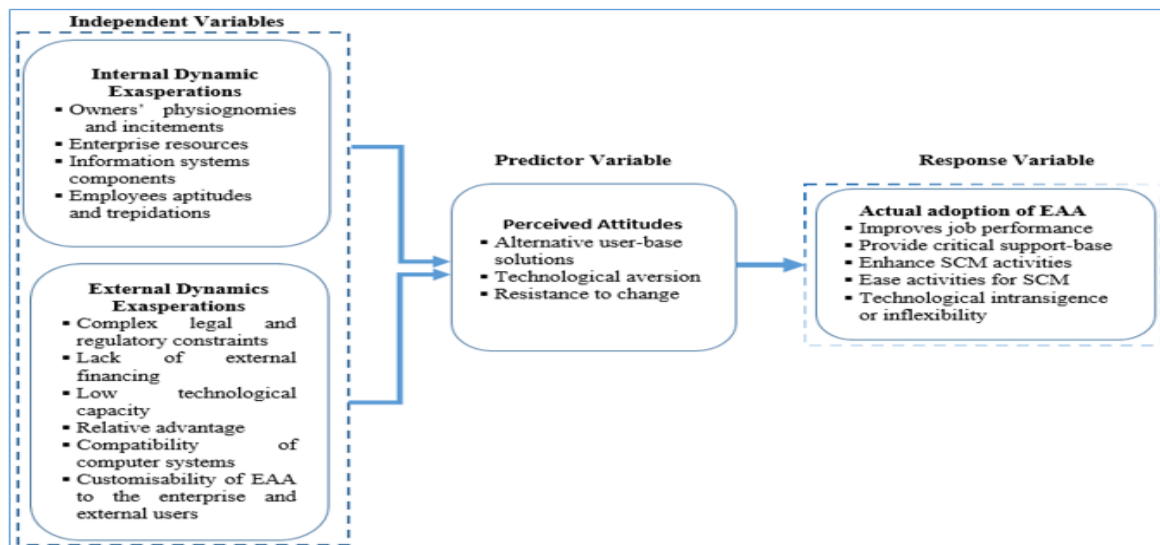


**Figure 1:** Conceptual Model
Source: *Author Conceptualisation, 2023*

**Internal Dynamic Exasperations (IDES)**

Much of the literature on IDEs deals with the myths of enterprise development, which includes operational and administrative procedures, Risk perceptions, attitudes, and behavioral intentions, innovation, financing and employee risks (Van de Watering, 2022; Alsaqal, Ahmed &Abdullah, 2021; Glückstad, 2022).

Little investigation on specific IDEs is explored in the AA of EAA, and it is not clear what factors constitute to the AA of EAA for SCM in SMEs. For the reason of these thoughtful technological advancements, IDEs are characterised by the subjective nature of SCM activities, emerging from miscellaneous factors. In certain circumstances, these nominalised forms can become extensive and complex with the following being discussed.

*Owner's physiognomies and incitements (OPIs)* - Traditionally, OPIs have subscribed to the belief that '*phrenology*' concentrated on the shape of the skull and made subsequent assumptions associated with the mental power; which fashioned various personality traits (Nguyen, 2010). Further, Desai (2022) defines OPIs as the association of certain personality traits transferred to physical traits that influence enterprise performance. The controversy about OPIs as scientific evidence for IDEs has exploded unchanged for over a century. As a result, the descriptions of OPIs in mid-19th-century realist fiction as a reflection of the period's norms and world views, on traditional belief, distorted belief, an implicit rejection of realism's epistemological basis, and self-perception as a possible projection of feelings towards the AA of EAA (Marits, 2003). One major speculative phenomena that has subjugated SMEs for many years' concerns the AA of EAA of which little is done to bridge the gap between well-established and developing enterprises.

*Enterprise resources inducements (ERIs)* – Almost every paper inscribed on ERP components included a sub-division relating to manufacturing and production, finance and accounting, human resources, sales, and marketing (Quirk, 2018; Nursidiq, 2022; Hayes, 2022). In the perspective and standpoint of this study, the ERIs specifically focused on resources linked with the AA of EAA on the following: financial resources for acquisition of competent labour, mainframe, and hardware and software systems, and architect experts. Although the exclusion of other components may not reduce the effect on the AA of EAA, algorithms are executed with caution and bearing in mind the effectuation theory. Unless SMEs consider the enterprise architect particularly the choice of technology and usage, solution architecture strategy, infrastructure strategy, inter-program collaboration, and implementation strategy, the AA of EAA will not be attained. An inference of this is the affirmation that ERIs need SMEs' economic power to be associated with SCM activities for a successful AA of EAA within SMEs.

*Information systems components (ISCs)* – ISCs is a expressions frequently used in the literature, but to date, there are no clear definitions attars to this. However, in the context of this study, ISCs is delineated as a composition of integrated sub-connected inputs that work together to produce meaningful results across the enterprise that includes order fulfilment, manufacturing flow and management, supplier relationship management and customer relationship management, and reverse logistics. ISCs operate effectively with the use of both internet and website connectivity that makes SCM more fashionable and flexible, within the enterprise and in the outside world (Zwass, 2022; Pham et al., 2022). In their study, Feuer and Lee (1988) acknowledge the psychomotor abilities that cover the interrelationship between the cognitive processes and sensorimotor cues that prime human responses when learning, acquiring, and retaining information based on environmental conditions. If the deliberation moved presumptuously, a better understanding of ISCs needs would lead to the restoration and/or AA of EAA.

*Employees' appetites and trepidations (EATs)* – EATs play a critical role within the concept of AA of EAA. Herr (2009) mollifies the paradoxes of human nature that drive high enactment within enterprises on emotional health, employees' interactions and work collaborations for increased productivity grounded on boost for emotional wellbeing. Helper (2022) postulates physiognomy on two aspects. *First* – Physiognomy as servitude based on submissive behaviour. *Second* - In a business context, many suffer financial and enterprise development difficulties based on geographic location for channel distribution, market unaccessibility, lack of collateral, racial primacy amongst others. Quirk (2018) ratifies the importance of ERIs in line with, financial management, business intelligence, customer relationship management, human resources, and SC management. This narrates the setting out and development of SMEs' viewpoint and approaches in addition to the algorithms used in assembling or developing EAA for SCM.

**External Dynamic Exasperations (EDES)**
Recent developments in 4IR have heightened the need for SMEs to adopt the best possible technology to manage SCM activities with agility. On the other standpoint, EDEs are synthesised using counter dynamics that are detailed for AA of EAA such as the existence of 3D technology, computer calculation speed/power, the ability of computers to create truly 'random' numbers, engine efficiency, internet connectivity, wireless charging and automation (Bush, 2016). Duggal (2022) postulates that organisations with enormous data analytics use analytic techniques to examine data to explore hidden patterns, correlations, market trends and consumer preferences. In this regard, this study makes several notable contributions to identifying external dynamics that might affect the enterprise. In this respect, this study makes several notable contributions to identifying EDEs that might affect the enterprise and acting to either leverage potential opportunities or mitigate potential threats. So far, six constructs have been identified as being potentially imperative in juxtaposition with EDEs: *First,* complex legal and regulatory constraints that are technically and extensively subjected to modifications (Mendoza, Dekker & Wielhouwer, 2016). *Second,* external financing which is regulated by financial institutions on three broad risk categories prior to financing SMEs that includes market risk, performance risk and specific risk (Schutte, Niemann & Kotzé, 2019). *Third,* low-technological capacity power-driven unclear indulgent of the difference between compliance investments and cleaner technologies (Pooe & Mhelembe, 2014). *Fourth,* relative advantage has a huge impact on the adoption of new technology for SCM, subsequent to SMEs that intent the AA of EAA

could gain competitive advantage based on superior transparency and improved security (Mthimkhulu & Jokonya, 2022). *(e) Firth,* traceability, and compatibility of computer systems include the network concept, which vary widely in their nature and operation, depending on the particular role players involved, that includes their relationships within the SCM activities and processes, notwithstanding the level and scope at which they operate, and the wider context (Chinomona, 2013). *Six*, customizability of hardware and software system for a successful EAA adoption that covers both internal and external users (Widowati, Sutrisno & Tjahjana, 2022).

### Perceived Attitudes (PAS)

PAs are deliberated as a learned tendency to evaluate situations, processes, and conditions in a certain approach, which includes three components (Cherry, 2021). (i) The cognitive component entails thoughts and beliefs about the subject phenomena. (ii) The affective element is determined by how the other indicators or elements provoke individual feelings. (iii) Behavioural component is based on how attitude affects someone's behaviour. More information on PAs would help to establish a better level of accuracy on this matter. While deciding on the best knowledge-based software, the SMEs ought to consider the following, universal or customised-knowledge software, line of authorities to authorise content accessibility, customisation for content, and reporting (Short, 2022). It has a linkage between the organisational motivations, courses of action, capabilities, value streams, and resources (Jeffs, 2022). The PAs has several practical applications. In general, it points to norms, beliefs, and fear of the unknown, unless they introduce the subject phenomena, constant monitoring, and sufficient time to learn through.

### Enterprise Application Architecture

In the antiquity of information systems, IDEs, EDEs and PAs have been thought of as key influences in the AA of EAA. EAA can be delineated as a structural map that illustrates the workflow assembled from different functional departments with ease-of-use of different applications that interact with each other to fulfil the enterprise goals (Ferguson, 2020b). It encompasses core types such as entities (business model classes that are persisted), aggregates interfaces, domain services, specifications, custom exceptions, guard clauses, domain events, and handlers.

However, Fauteaux (2022) and Gillin (2022b) explicate major challenges with this kind of EAA includes (a) Efficiently specifying materials which include the use of data from customer relationship management for an Architect Expects to digitise algorithms for SCM activities. (b) Maintaining changing technologies, which is linked with distributor automation by enhancing the responsiveness of SMEs' SC. (c) Providing solutions for affordable SCM solutions that characterised by economies of scale, cstoms and fiscal solutions. (d) Navigating the IDEs and EDEs that includes; globalisation regulations, integrated information systems, and customer service. (e) Coping with architect costs for assembling architect diagram, and complexity in functionality with respect to monolithic or service-oriented approach (g) Performance and scalability in line with elements of web application architecture that might also be applied to distribute some processing to user endpoints. In agreement Jeffs (2022) writes that SMEs could automate data analysis, providing inferences for deviations and delays for continuous improvement.

Amidst all this, the EAA requires diverse input requirements, organisational boundary divisions, and tool boundary divisions, volatility of requirements, traceability, and integration with change and configuration management systems.

### Research Methodology

A quantitative approach was employed to reveal the association between variables. A stratified random sampling best known as proportional random sampling used selected and divided both SMEs' owners and managers into homogenous groups. This was based on common traits such as managerial competencies and experience, discipline, curiosity, creativity, experimentation and risk taking. Four municipalities were considered as study areas: Blouberg (Bochum), Molemole (Dendron), Polokwane (Pietersburg), and Lepelle-Nkumbi (Lebowakgomo) municipalities. From the study population, 310 SMEs

owners and managers completed the sampling process and returned the questionnaire. Five items on the questionnaire measured the extent to which PAs bring an impact on the AA of EAA.

## Results
### Stability diagnostic tests
*Reliability - Cronbach's Alpha*

Table 2 presents the results on Cronbach's Alpha (α) for all $X_s$, $PV_s$ and response variable. The population is apprehended from a sample of 310 SME owners and managers. The correlation between OPIs, ERs, ISCs, EATs, EDEs, PAs and AA of EAA were tested. The rule of thumb is rated at .75 for basic research. Subsequently, the internal consistency achieved more than .85 as an accurate measure of scale indicating that of the variance in the scores is reliable variance.

**Table 2:** Cronbach's Alpha per variable

| ITEM-TOTAL STATISTICS | | | | |
|---|---|---|---|---|
| **Variables** | **Scale Mean if Item Deleted** | **Scale Variance if Item Deleted** | **Corrected ItemTotal Correlation** | **Cronbach's Alpha if Item Deleted** |
| Owners' physiognomies and incitements | 378.7647 | 1683.944 | .196 | .874 |
| Enterprise resources | 370.4971 | 1618.457 | .370 | .872 |
| Information systems components | 369.9382 | 1516.471 | .603 | .866 |
| Employees aptitudes and trepidations | 365.0529 | 1509.826 | .591 | .867 |
| External dynamic exasperations | 352.6500 | 1357.933 | .683 | .868 |
| Perceived attitudes | 365.5206 | 1459.413 | .557 | .870 |
| AA of EAA | 381.6029 | 1641.880 | .310 | .873 |

*Source: Author conceptualisation, 2023*

Consequently, .13% is error variance. The reliability of the subscale was as; thus, .874, .872, .866, .867, .868, .870 and .873. The α assumes the unidimensionality that all the items measured a single dimension.

*Double-Exponent Distribution on AA of EAA*

Figure 1, demonstrates the double-exponent distribution, regarded as a symmetric distribution. Amidst, other distributions such as; normal-random numbers, Cauchy-random numbers, and Weibull-distribution, the double-exponent distribution it has a sturdy peak, more swift degeneration, and with weightier tails.
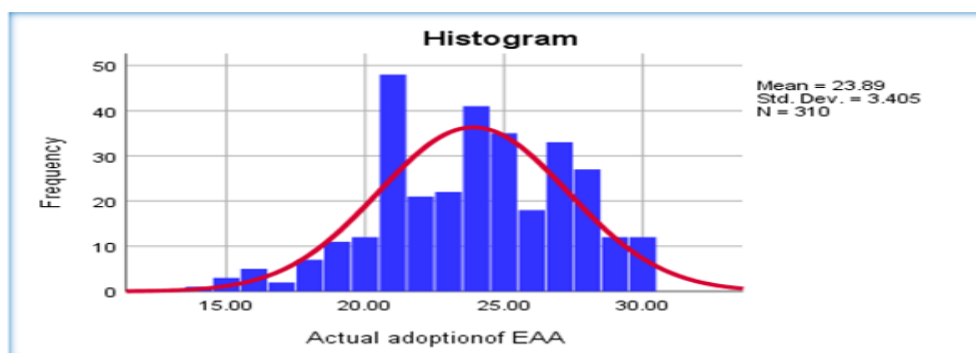


**Figure 2**: Double-exponent distribution on AA of EAA.
Symmetric distribution, where: N = 310, mean ≈ median @ 23.89, skewness = -.289; Kurtosis = -.344; σ = 3.405
*Source: Author Conceptualisation, 2023*

The mean is 23.89, N = 310, both mode and median serve the different proportion that produced an asymmetric distribution. The skewness and kurtosis are at -2.89 and -.344, chronologically. The distribution is skewed to the left and right away from the mean, mode and median with tails that vary (indicates asymmetry). Taken together, these results suggest that there is an association between $X_s$, $PV_s$ and Y. Therefore, in broad-spectrum, the data is reliable and valid to further analyse results for model summary, linear regression, regression Analysis (Algebra Expression), and Beta weight.

## Findings
### Model Summary table 3
Table 3 presents the model summary for $X_s$, PV and Y on the conception of direct and indirect relationships for the AA of EAA for SCM. For that reason, the model summary is appropriate for direct and indirect relationships with six positive slopes, and single negative slope amidst their accounts of the events form variables.

**Table 3**: Model Summary

| Model Summary | | | | | |
|---|---|---|---|---|---|
| | S | R-sq | R-sq (Adj) | R | |
| OPIs | 3.263 | 0.034 | 0.330 | 0.184 | |
| ERIs | 4.174 | 0.101 | 0.087 | 0.318 | |
| ISCs | 3.761 | 0.067 | 0.052 | 0.259 | |
| EATs | 6.211 | 0.120 | 0.110 | 0.346 | |
| EDEs | 5.571 | 0.057 | 0.042 | 0.239 | |
| PAs | 3.295 | 0.051 | 0.040 | 0.226 | |
| AA of EAA | 3.405 | 0.158 | 0.145 | 0.397 | |
| **Coefficients** | | | | | |
| Terms | Coef | SE Coef | T-Value | P-value | Regression Equations |
| Constant | 19.486 | 1.346 | 14,477 | .001[b] | 19.49 + 0.19*x (Level of OPIs) |
| OPIs | .193 | .058 | 3.328 | | |
| Constant | 17.830 | 1.047 | 17.030 | .000[b] | 17.84 + 0.26*x (Level of ERIs) |
| ERIs | .259 | .044 | 5.886 | | |
| Constant | 18.235 | 1.213 | 15.032 | .000[b] | 18.23 + 0.24*x (I Level of ISCs) |
| ISCs | .235 | .050 | 4.700 | | |
| Constant | 16.120 | 1.214 | 6.552 | .000[b] | 16.12 + 0.19*x (Level of EATs) |
| EATs | .190 | .029 | 6.552 | | |
| Constant | 19.821 | .962 | 20.604 | .000[b] | 19.82 + 0.15*x (Level of EDEs) |
| EDEs | .146 | .034 | 4.294 | | |
| Constant | 25.80 | .508 | 50.787 | .000[b] | $25.8 - 0.23 \ast x$ (Level of PAs) |
| PAs | -.233 | .057 | -4.088 | | |
| Constant | 3.553E-15 | 3.147 | 1.130 | .000[b] | $2.49E - 14 + 1 \ast x$ (Level of AA: EAA) |
| PRE_1 | 1.000 | .132 | 7.58 | | |

Source: Author Conceptualisation, 2023

*Dependent variables:*
    Given all parameters, the following results provide a predominant emphasis to the study. R-Squared ($R^2$ or the coefficient of determination) is a statistical measure in a regression model that determines the proportion of variance in the Y that could be explained by the $X_s$.

    *First*: The R-squared ($R^2$) = 0.034, adjusted to 0.330 for OPIs indicating the best fit in the regression model. P (P-Value) < coefficient ($\alpha$); wherein the coefficient for the slope ($\beta_1$) < null hypothesis ($H_{01}$). Therefore: $H_{01}$ where; P < α, then $\beta_1$ (regression coefficients\slope) ≠ 0. Consequently; 19.486 > .001[b]. The slope (Δ) = 0.19*, indicating that there is a positive relationship between OPIs and AA of EAA (Y). This indicates that the dependent variable (Y) will increase with the same proportion of 0.19*, holding all other independent variable ($X_n$…) constant. The $H_{01}$ is rejected and support the $H_{a1}$ *(Alternative hypothesis)* that *"There is a positive relationship between IDEs: OPIs and PAs towards the AA of EAA for SCM in SMEs" (indirect relationship).*

    *Second*: The $R^2$ = 0.101, adjusted to 0.087 for ERIs demonstrating the best fit in the regression model. P < α; where; the coefficient for $\beta_2$ < $H_{02}$. Therefore: $H_{02}$ where; P < α, then $\beta_2$ ≠ 0. Accordingly; 17.830 > .000[b]. The Δ = 0.26*, indicating that there is a positive relationship between ERIs and AA of EAA (Y). This indicates that Y will increase with the same proportion of 0.26*, holding all other $X_n$… constant. The $H_{02}$ is rejected

and sustain the $H_{a2}$. *"There is a positive relationship between IDEs: ERIs and PAs towards the AA of EAA for SCM in SMEs"* (indirect relationship).

***Third:*** The $R^2$ = 0.067, adjusted to 0.052 for ISCs signifying the best fit in the regression model. P < $\alpha$; where; the coefficient for $\beta_3 < H_{03}$. Hence: $H_{03,}$ where; P < $\alpha$, then $\beta_3 \neq 0$. As a result; 18.235 > .000$^b$. The $\Delta$ = 0.24*, indicating that there is a positive relationship between ISCs and AA of EAA (Y). This indicates that Y will increase with the same percentage of 0.24*, holding all $X_n$… constant. The $H_{03}$ is rejected and withstand the $H_{a3.}$ = *"There is a positive relationship between ISCs: EATs and PAs towards the AA of EAA for SCM in SMEs"* (indirect relationship).

***Fourth:*** The $R^2$ = 0.120, adjusted to 0.110 for EAT validating the best fit in the regression model. P < $\alpha$; where; the coefficient for $\beta_4 < H_{04}$. At that time: $H_{04}$ where; P < $\alpha$, then $\beta_4 \neq 0$. Accordingly; 16.120 > .000$^b$. The $\Delta$ = 0.19*, indicating that there is a positive relationship between EATs and AA of EAA (Y). This indicates that Y will increase with the same proportion of 0.19*, holding all other $X_n$… constant. The $H_{04}$ is rejected and withstand the $H_{a4.}$ *"There is a positive relationship between IDEs: EATs and PAs towards the AA of EAA for SCM in SMEs"* (indirect relationship).

***Fifth:*** The $R^2$ = 0.057, adjusted to 0.042 for EDEs confirming the best fit in the regression model. P < $\alpha$; where; the coefficient for $\beta_5 < H_{05}$. Henceforth: $H_{04}$ where; P < $\alpha$, then $\beta_5 \neq 0$. Accordingly; 19.821 < 1.000$^b$. The $\Delta$ = 0.15*, indicating that there is a positive relationship between EDEs and AA of EAA (Y). This indicates that Y will increase with the same proportion of 0.15*, holding all other $X_n$… constant. The $H_{05}$ is rejected and withstand the $H_{a5.}$ *"There is a positive relationship between EDEs and PAs towards the AA of EAA for SCM in SMEs"* (indirect relationship).

***Sixth: Predictor Variable:*** The $R^2$ = 0.051, adjusted to 0.040 for PAs approving the best fit in the regression model. P < $\alpha$; Henceforward; the coefficient for $\beta_6 > H_{06}$. Therefore: $H_{06}$ where; P > $\alpha$, then $\beta_6$ = 0. Accordingly; 25.80 > .000$^b$. The $\Delta$ = -0.23*, indicating that there is a negative relationship between PAs and AA of EAA (Y). This indicates that Y will decrease with the same proportion of -0.23*, holding all other $X_n$… constant. The $H_{06}$ is accepted and rejected the $H_{a6.}$ *"There is a negative relationship between PAs towards the AA of EAA for SCM in SMEs"* (indirect relationship).

***Seventh: Response Variable:*** The $R^2$ = 0.158, adjusted to 0.145 for AA of EAA approving the best fit in the regression model. $H_{a7}$ = P < $\alpha$; where; the coefficient for $\beta_7 < H_{07}$. Henceforth: $H_{06}$ where; P > $\alpha$, then $\beta_7$ = 0. Accordingly; 2.49E > .000$^b$. The $\Delta$ = 1*, indicating that there is a positive relationship between x, predictor variables and response variable. This indicates that Y will increase with the same proportion of 1*, holding all other $X_n$… constant. The $H_{07}$ is accepted and rejected the $H_{07.}$ *"There is a positive relationship between IDEs, EDEs and PAs towards the AA of EAA for SCM in SMEs"* (indirect relationship).

Figure 3 illustrates graphical expression of MLR with $X_s$, RV, and Y. The applicability of PRE_1 originated as it established an automated positive slope on the AA of EAA as it is superficial in MLR.
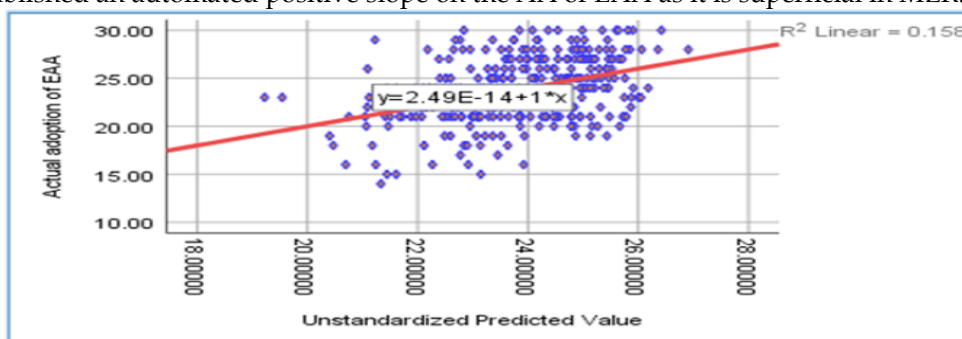


**Figure 3: Multiple Regression on AA of EAA and Unstandardized Predictable Value**
*Source: Author Conceptualisation, 2023*

Zach (2021) exemplify the assumptions whilst computing MLR. (a) *Linear relationships* - exist between IDEs, EDEs, PAs and AA of EAA. Thus, Y and $X_n$... (b) No multicellularity residuals are normally distributed, and $X_{ns}$ are not highly correlated (multivariate normality), and $X_{ns}$...are not highly correlated. (c) Observations are independent. (d) There is homoscedasticity indicating that the residuals have constant variance at every point in the linear model. (e) Multivariate normality entails the residuals of the model are normally distributed. The data described here appear to maintain the assumption that serves as pre-requisite to achieve the desired outcomes.

**Regression Analysis: Algebra Expression**
The test for additional group of variables on interest provided significant increase to the predictions of the output denoted as '' Y''. As it was determined that at least one of the regressors brings a significant change, it is important to consider the fact that an increase in error variables permits an increase in the regression sums of squares. MLR, where; PAs towards the AA of EAA determine Y. The model summary is expressed into algebra.

Where: $Yi = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_5 x_5 + \beta_6 x_6 + \varepsilon$ ..................................... [Eqn_1]

At this point, Y is the dependent variable, and $X_1, X_n$ are denoted by *n* independent variables (x). Another major source of uncertainty is in the method used to calculate X: the weights, $x_1$, $x_2$, $x_n$, regression analysis ensures maximal prediction of the dependent variable from the set of x, calculated through by least squares estimation.
Simplified:
- Yi = AA of EAA
- $\beta_0$ = Constant term/intercept in the model, $x_1$ & $x_2$ = 0
- $\beta_1$ = Are the regression coefficients signifying the change in y comparative to a one-unit change in $x_1$ and $x_2$, respectively
- $X_1$ = Owners' physiognomies and incitements (IDEs)
- $X_2$ = Enterprise resources inducements (IDEs)
- $X_3$ = Information system components (IDEs)
- $X_4$ = Employees aptitudes and trepidations (IDEs)
- $X_5$ = External dynamics exasperations (EDEs)
- $X_6$ = Perceived attitudes (PAs)
- $\varepsilon_i$ = Residual error

$Y = 19.49x_1 + 17.84x_2 + 18.23x_3 + 16.12x_4 + 19.82x_5 + 25.80x_6 + 2.49Ex_6 + \varepsilon$ ....................... [Eqn_2]

Therefore, from the equation, the error on unstandardized coefficients for constant and PRE_1 is 3.147 and 0.132, chronologically.
Given the n observation
$(Y_1, \beta_1 x_1 + ... + \beta_5 x_5 + \varepsilon), ..., (Y_n, \beta_{n1} n x_1 + ... + \beta_{n5} x_{n5} + \varepsilon)$ ....................................................... [Eqn_3]

**Beta weight**
A beta ($\beta$) weight is demarcated as a slope of a line in a regression equation, also referred to as a standardized regression coefficient. These is pragmatic as $X_s$, PV, and Y as the criterion, which are standardized and converted to z-scores. A $\beta$ weight is equal the correlation coefficient ($\rho$) @ .3.553E-15 as a multiple predictor variable. In terms of the $\beta$ weight ($\beta$ = 3.553E-15, *p* < .000), it constituted the greatest contribution to the regression equation when applying ceteris-paribus (when holding all other predictors constant). The zero-order correlation (r = .398) is witnessed as the second largest in the model, and when squared, it indicated arithmetic value @ 15.84 on variance cognitive. The squared ($MLR^2$ = .158 ≈ $\sqrt{.158}$ = .39) illustrated that AA of EAA shared the second largest amount (158%) of variance with Y. The findings of the current study are consistent with those of Laura, Nathans, Oswald and Nimon (2012) who report that

it is important that a single $X_n$ may be deemed the most important through one predictor. Another X may achieve prominence through another predictor variable(s). Due to IDEs and EDEs, it appears that AA of EAA alone is not the causative factor of SCM success.

## Recommendations

This study endorses and countersigns that before presenting the Y, in a study such this one should be carried out on the assumption and assumption of MLR such as linear relationship, multicollinearity, independence, homoscedasticity and multivariate normality. However, more exploration and consideration on this topic needs to be undertaken before the association between $X_n$, PV, and Y. Prior to any formal analysis, it is highly recommended that future researchers consider a pilot study to authenticate the following: sample size and selection, testing measurement instrument, data entry and analysis. Predominantly, to look at data to see whether possible problems or questionable data points are detected. For safety, it is advisable to review and take into account free data science short courses, forecasting methods, distribution, random variables and regression analysis. In consequence, it is suggested that similar research studies that includes determining $X_1 + X_2 + \ldots X_n$ of the scores accumulated in MLR, which could be processed with outliers from large sample.

## Conclusion

Data administered through SPSS for both simple linear regressions, and MLR produced anticipated results denoted by Y, determined by three items: $X_n$, PV and Y. The MLR determined the influences and relationships amidst IDEs, EDFs, PAs, and AA of EAA. Therefore:

$Y = 19.49 + 0.19 X1 + 17.84 + 0.26 X2 + 18.23 + 0.24 X3 + 16.12 + 0.19 X4 + 19.82 + 0.15 X5 + 25.80 + [(-0.23) X6 + 2.49E + (-14)] X7 + 1$

$Y = 20.68 + 36.20 + 55.41 + 65.24 + 99.85 + 153.42 – 79.57$

$Y = 351.23$

The degree model explaining the variance of Y was $R^2 = 0.158$. Reflecting on the coefficients, it can be assumed that the model predicts the Y very well. Examining the contributions of $X_n\ldots$ in the model, it is found that $X_n\ldots$ and PV made the greater influence with the value of ($\beta = 3.553$), followed by the scores received from OPIs, ERs, ISCs & EATs, and PAs, respectfully on the AA of EAA.

## Limitations and Direction for Future Research

Careful considerations are inevitable in unfolding the MLR assumptions and, such as linearity, normality, homoscedasticity, independence, and multicollinearity. In some instances, it is impossible to identify multiple outliers, as a result of predictor standards, except for those that are disregarded. In future investigations, it might be possible to use a different constructs in IDs, EDEs, as well as in PAs. This could include the possibility for exploring new complete measure for both independent and predictor variable.

## References

Alsaqal, A.H., Ahmed, H.A. & Abdullah, A.J. 2021. 'The Role of Strategic Physiognomy to Avoid the Strategic Drift', viewed 9 October 2023. *Journal of Academy of Strategic Management*, 20(S5):1-11, viewed 19 September 2023. From: https://www.abacademies.org/articles/the-role-of-strategic-physiognomy-to-avoid-the-strategic-drift.pdf.

Anon, 2020. '*The five social appetites that drive high performance, Chapter 1*', viewed 13 July 2023, from: *http://www.paulherrconsulting.com/pdf%20files/05_ch1.pdf.*

Barrett, B, 2022, '*Psychomotor Ability: What Does Psychomotor Ability Mean*?', viewed 15 June 2023, from: https://www.workplacetesting.com/definition/5218/psychomotor-ability.

Anderson, M. & Perrin, A. 2017. '*Barriers to Adoption and Attitudes towards Technology*', Viewed 11 July 2023, from:http://www.pewinternet.org/2017/05/17/barriers-to-adoption-and-attitudes-towards-technology/.

Badenhorst-Weiss, J.A., van Biljon, E.H.B. & Ambe, I.M. 2017. '*Supply chain management: A balanced approach. 2nd Edition, South Africa, Braamfontein.*

Behara, G.K. 2022. '*Enterprise architecture tool strategy*', viewed 4 October 2023, from: https://www.architectureandgovernance.com/applications-technology/enterprise-architecture-tool-strategy/.

Bush, T., 2016. '*PESTLE Analysis: Technological Factors Affecting Business*', viewed 17 August 2023, from: https://pestleanalysis.com/technological-factors-affecting-business/.

Bvarta, 2022. '*5 Benefits of Enterprise Architecture for All Business*', viewed 23 August 2023, from: https://bvarta.com/5-benefits-of-enterprise-architecture-for-all-business/.

Cherry, K., 2021. '*Attitudes and behavior in psychology*', viewed 18 August 2023, from: https://www.verywellmind.com/attitudes-how-they-form-change-shape-behavior-2795897.

Chinomona, R., 2013, 'Information technology resource as a facilitator of suppliers' collaborative communication, network governance and relationship longevity in supply chains', *Journal of Transport and Supply Chain Management* 7(1), Art. #83, 10 pages', viewed 27 August 2023, from: http://dx.doi.org/10.4102/jtscm.v7i1.83.

Dargham, A., 2021, '*Effectuation principles: a theory for entrepreneurs*', viewed 13 August 2023, from: https://www.daacap.com/effectuation-principles-a-theory-for-entrepreneurs/.

Dameieibi, D. 2020. *Three components of attitude*, viewed 6 November 2023, from: https://prezi.com/p/hgehg3yetpar/three-components-of-attitude/.

Ertz, M., Rouzies, D. & Sarigollu, E. 2022. '*The impact of brand equity on employee attitudes*', viewed 9 October 2023). From: https://www.researchgate.net/publication/363868670_The_impact_of_brand_equity_on_employee_attitudes.

Helper, R., 2022. "*What Is Physiognomy*? Viewed 15 August 2023, from: https://study.com/academy/lesson/physiognomy-definition-examples-quiz.html.

Duggal, N., 2022. '*Top 7 Benefits of Big Data and Analytics and Reasons to Consider It For Your Next Career Move*', viewed 17 August 2023, from: https://www.simplilearn.com/benefits-of-big-data-and-analytics-article.

Fauteaux, D., 2022. '*Top Challenges Facing Architects in 2022*', viewed: 22 August 2023, from: https://www.manobyte.com/growth-strategy/top-challenges-for-architects.

Ferguson, K. 2019a. '*Application architecture*', viewed 22 August 2023, from techtarget.com/searchapparchitecture/definition/application-architecture.

Ferguson, K., 2020b, '*What Are the Challenges and Benefits of ERP Software*? Viewed 14 June 2023, from: https://www.techtarget.com/searcherp/What-Are-the-Challenges-and-Benefits-of-ERP-Software.

Feuer, D. & Lee, C., 1988. '*The Kaizen Connection: How Companies Pick Tomorrow's Workers. Training*'. May 23–35, viewed 16 June 2023, from: https://opentextbc.ca/organizationalbehavioropenstax/chapter/employee-abilities-and-skills/#ch02rfin-6.

Firican, G. 2020. '*The pros and cons of the 4th industrial revolution*', viewed 3 October 2023, from: https://www.lightsondata.com/pros-cons-4th-industrial-revolution/.

Gillin, P., 2022b. '*A guide to best practices for enterprise application architecture*'. From: https://www.mendix.com/blog/best-practices-for-enterprise-application-architecture/.

Glückstad, F.K. 2022. '*Risk perceptions, attitudes, and behavioral intentions to spend on experiences in the post-Corona crisis: Data from Italy, Denmark, China, and Japan*', viewed 9 October 2023. From: https://www.sciencedirect.com/science/article/pii/S2352340922004619.

Flower, G. 2022. '*Five tech trends that will impact businesses in 2022 and beyond*' viewed 15 August 2022, from: https://www.forbes.com/sites/forbesbusinessdevelopmentcouncil/2022/03/10/five-tech-trends-that-will-impact-businesses-in-2022-and-beyond/?sh=322dbcdf4058.

Gillin, P. 2022b. '*A guide to best practices for enterprise application architecture*', viewed 9 October 2023, from: https://www.mendix.com/blog/best-practices-for-enterprise-application-architecture/.

Gillin, A. 2020a. '*Creating an enterprise architecture strategy for the digital age*', viewed 4 October 2023, from: https://www.metisstrategy.com/creating-an-enterprise-architecture-strategy-for-the-digital-age/.

Herr, I.P., 2009. '*Primal Management: Unraveling the Secrets of Human Nature to Drive High Performance Hardcover*' viewed 15 August 2023, from: https://www.amazon.ae/Primal-Management-Unraveling-Secrets-Performance/dp/081441396X.

Hayes, K., 2022, '*ERP Components: Core Parts to Enterprise Resource Planning*', viewed 15 August 2023, from: https://www.selecthub.com/enterprise-resource-planning/6-main-erp-components/.

Heylighen, F. & Joslyn, C. 1992. '*What is a systems theory?*' Viewed 4 November 2023, from: http://pespmc1.vub.ac.be/SYSTHEOR.html.

Igbal, F. '*From Resistance to Acceptance and Adoption, understanding the journey*', viewed 23 August 2023, from: https://blogs.sap.com/2018/04/05/from-resistance-to-acceptance-and-adoption-understanding-the-journey/.

Jeffs, A., 2022. '*Why enterprise architects will need to focus on innovation in the coming years*', viewed 18 August 2023, from: https://www.processexcellencenetwork.com/big-data-analytics/articles/why-companies-should-move-away-from-manual-process-discovery.

Jones, D. 2018. '*5 Technologies that are the Building Blocks of Digital Transformation*', viewed 17 August 2023, from: https://www.thinksys.com/cloud/5-technologies-that-are-the-building-blocks-of-digital-transformation/.

Laura L. Nathans, L.L., Oswald, F.L., & Nimon, K., 2012, '*Interpreting Multiple Linear Regression: A Guidebook of Variable Importance*', viewed 12 June 2023, from: https://www.researchgate.net/publication/236296691_.

Levinson, H., 1971. '*Conflicts That Plague Family Businesses*', viewed 15 August 2023, from: https://hbr.org/1971/03/conflicts-that-plague-family-businesses.

Maiti, S., 2022. '*What is an Information System?*' 5 *Components, Types, Advantages, Disadvantages*, viewed 13 August 2023, from: https://educationleaves.com/what-is-an-information-system-5-components-types-advantages-disadvantages-pdf-included/.

Mendoza, J. P., Dekker, H. C., & Wielhouwer, J. L. 2016. *Firms' compliance withcomplex regulations. Law and Human Behavior*', 40(6), 721-733. From: https://psycnet.apa.org/doiLanding?doi=10.1037%2Flhb0000215 (accessed 14 June 2023).

Morternsen, D.H. 2002. '*The Basic Principles of Effectuation – How to Use What You Already Have to Become More Innovative*', viewed 6 September 2023, from: https://www.interaction-design.org/literature/article/the-basic-principles-of-effectuation-how-to-use-what-you-already-have-to-become-more-innovative.

Mthimkhulu, A. & Jokonya, O., 2022, 'Exploring the factors affecting the adoption of blockchain technology in the supply chain and logistic industry', *Journal of Transport and Supply Chain Management*', viewed 7 August 2023: 16(0), a750. https://doi.org/10.4102/jtscm.v16i0.750.

Nguyen, S., 2010," *Industrial & Organisational Psychology, leadership, teams, training & development: 6 steps to manage resistance to change*", viewed 25 February 2023, From: https://work placepsychology.net/2010/05/13/6-steps-to-manage-resistance-to-change/.

Ninn, M. 2019, '*The Causes of -- and Solutions to -- Tech Aversion*', viewed 18 August 2023, from: https://www.gallup.com/workplace/257657/causes-solutions-tech-aversion.aspx.

Nursidiq,. S.I., 2022. '*6 Essential ERP Components to Escalate Your Business*', viewed 13 August 2023, from: https://www.hashmicro.com/blog/erp-components/.

Okunbajo, O. 2022. '*Overview of system theory*', viewed 4 November 2023, from: https://www.academia.edu/9053157/Overview_of_System_Theory.

Ortiz, P.C., 2022, '*Top 10 challenges of enterprise development*', viewed 1 October 2023, from: https://flexisourceit.com.au/resources/blog/top-10-challenges-of-enterprise-application-development/.

Peričić,. T.P. & Tanveer, S. 2019, '*Why systematic reviews matter*', reviewed 14 August 2023, from: https://www.elsevier.com/connect/authors-update/why-systematic-reviews-matter.

Pham, L.T., Desai-Naik, T., Hammond, L. & Abdeljabbar, W. 2022, '*Identifying the components of information systems*' viewed: 15 June 2023, from:https://workforce.libretexts.org/Bookshelves/Information_Technology/Information_Systems/Information_Systems_for_Business/01%3A_What_Is_an_Information_System/01%3A_What_Is_an_Information_System/1.02%3A_Identifying_the_Components_of_Information_Systems.

Pooe, R.I.D. & Mhelembe, K., 2014, 'Exploring the challenges associated with the greening of supply chains in the South African manganese and phosphate mining industry', viewed 18 May 2023, *Journal of Transport and Supply Chain Management*: 8(1), Art. #139, 9 pages. http://dx.doi. org/10.4102/jtscm.v8i1.139.

Proctor, K. 2015. '*General systems theory*', viewed 4 November 2023, from: https://prezi.com/1y_6o6mt88k2/general-systems-theory/.

Quirk,. E., 2018, '*The 5 Main Components of ERP Software You Need*', viewed 13 August 2023, from: https://solutionsreview.com/enterprise-resource-planning/the-main-components-of-erp-software-you-need/.

Roznovsky, A., 2021. "*Benefits of ERP: 10 advantages and 5 disadvantages of enterprise resource planning*', viewed: 14 June 2023, from: https://light-it.net/blog/what-are-the-primary-business-benefits-of-an-erp-system/.

Sáenz, A., 2022. '*How to drive tech adoption among crop breeders? This new framework is key*', viewed 14 June 2023, from: https://excellenceinbreeding.org/blog/how-drive-tech-adoption-among-crop-breeders-new-framework-key.

Short, J., 2022. '*The 11 Best Knowledge Base Software Platforms for 2022*', viewed 18 August 2023, from: https://www.helpscout.com/blog/knowledge-base-software/.

Schutte, F., Niemann, W. & Kotzé, T., 2019, 'Postshipment financial flows in supply chains: A study of small- to medium-sized enterprise importers', Journal of Transport and Supply Chain Management 13(0), a452. From: https://doi.org/ 10.4102/jtscm.v13i0.452 (accessed 14 May 2023).

Suhadak, R.O. & Mawardi, K.M. 2017. '*Analysis of the Influence of External and Internal Environmental Factors on Business Performance: A study on micro small and medium enterprises (MSMEs) of food and beverage*', viewed 2 June 2023', from: https://www.researchgate.net/publication/318214243_analysis_of_the_influence_of_external_and_internal_environmental_factors_on_business_performance_a_study_on_micro_small_and_medium_enterprises_msmes_of_food_and_beverage.

Teenboom, L, 2018. '*Application of Systems Theory in Business Organizations*', viewed 8 June 2023, from: https://smallbusiness.chron.com/application-systems-theory-business-organizations-73405.html.

Thompson, M. 2022. '*Route to Market & Supply Chain Blog: Supply Chain Change – 6 External Factors to Consider*', viewed 6 October 2023, from: https://supplychain.enchange.com/supply-chain-change-6-external-factors-to-consider.

Tupper, C.D. 2011. '*Enterprise Architecture Frameworks and Methodologies*', viewed 3 November 2023, from: https://www.sciencedirect.com/topics/computer-science/the-open-group-architecture-framework.

Wilkinson, L.A. 2022. 'Systems theory', viewed 6 November 2023', from: https://link.springer.com/referenceworkentry/10.1007/978-0-387-79061-9_941#:~:text=Systems%20theory%20was%20first%20introduced,systems%20associated%20with%20classical%20science.

Williams, K., Scalia, S. & Zandbergen, P. 2022. '*Information Systems: Examples & Types*', viewed 13 August 2022, from: https://study.com/learn/lesson/information-systems-examples-types.html.

Widowati, W., Sutrisno, S. & Tjahjana, R.H., 2022, 'Using fuzzy expectation-based programming for inventory management', *Journal of Transport and Supply Chain Management* 16(0), a782. https://doi.org/10.4102/jtscm.v16i0.782 (accessed 14 May 2023).

Van de Watering, R. 2022. 'The role of enterprise architecture-driven dynamic capabilities and operational digital ambidexterity in driving business value under the COVID-19 shock', viewed 9 October 2023, from: https://doi.org/10.1016/j.heliyon.2022.e11484.

Yang, C., Avgeriou, P., Liang, P. & Eliasson, U. 2017. '*Architectural assumptions and their management industry: An exploratory study*', viewed 3 November 2022, from: https://www.researchgate.net/publication/319106038_Architectural_Assumptions_and_Their_Management_in_Industry_-_An_Exploratory_Study.

Zach, 2021. '*The Five Assumptions of Multiple Linear Regression*', viewed 1 September 2022, from: https://www.statology.org/multiple-linear-regression-assumptions/.

Zachman, J.A. 2008. '*The concise definition of the Zachman framework by: John A. Zachman*'. Viewed accessed 9 October 202, from: https://www.zachman.com/about-the-zachman-framework.

Zemmouchi-Ghomari, L. 2021. The basic concepts of information systems, accessed 9 October 2023', from: https://www.researchgate.net/publication/353381296_the_basic_concepts_of_information_systems

Zwass, V, 2022. '*Information retrieval system, information storage and retrieval system, information storage system*', viewed 15 June 2022, from: https://www.britannica.com/topic/information-system.

**Annexure A** - Summary table: IDEs, EDEs, PAs, and AA of EAA

| Authors | Variables | Title | Aim\Objectives | Findings\Results | Conclusions |
|---|---|---|---|---|---|
| Suhadak & Mawardi, 2017 | IDEs | Analysis of the influence of external and internal environmental factors on business performance: a study on micro small and medium enterprises (MSMEs) of food and beverage. | This study aimed to analyze and explain the influence of external environmental factors on internal environmental factors, along with the influence of external and internal environmental factors on business performance. | The results of the analysis indicate that the internal environmental factors positively and significantly affect the business performance in MSMEs of Food and Beverage in BatuCity. | For owners or managers of Micro Small and Medium Enterprises (MSMEs), they need to increase the competence of entrepreneurship in order to be able to face competition. |
| Alsaqal, Ahmed & Abdullah, 2021 | OPIs | The role of strategic physiognomy to avoid the strategic drift. | Identify the availability of strategic dimensions of physiognomy in the study sample organizations. Identifying the level of availability of the dimensions of strategic drift in the study sample organizations. Identifying the impact of strategic physiognomy in avoiding strategic drift in the study sample organizations. | The banks of the research sample did not give the strategic physiognomy sufficient attention despite its great importance for organizations as it adopts most of the leading organizations of strategic physiognomy important activity that can respond to anticipate environmental changes and rapid response. | The study recommends the necessity of increasing the interest of organizational leaders in banks with the philosophy of strategic physiognomy and the adoption of it by banks Because of its effect on avoiding strategic drift, A |
| Zemmouchi-Ghomari, 2021 | ISCs | The basic concepts of information systems. | To describe information systems applications covering functional areas and focusing on the execution of business processes across the enterprise, including all management levels. | An information system can be defined as a set of interconnected components that gather, process, store and dispense information to support decision making and control in an organization. An IS can be seen as a socio-technical system. | A company has systems to support the different managerial levels: transaction processing systems, management information systems, decision support systems, and systems dedicated to business intelligence |
| Ertz, Rouzies & Sarigollu, 2022 | EATs | The impact of brand equity on employee attitudes. | Details the extent to which alignment between top and mid-level executives' attitudes affects lower-ranking employees' attitudes | The psychology and behavioural literature could provide deeper insights into this mechanism. | Associations with brands should be made less salient for mid-level executives, part-time jobs, services settings, and long-tenured staff. |
| Glücksta, 2022 | PAs | Risk perceptions, attitudes, and behavioral intentions to spend on experiences in the post-Corona crisis: Data from Italy, Denmark, China, and Japan. | To provide comprehensive cross-cultural data on individuals' value priorities, risk perceptions, attitudes, and behavioral intentions to spend on experiences in the post-Corona crisis. | The dataset provides comprehensive cross-cultural data on individuals' value priorities, risk perceptions, attitudes, and behavioral intentions to spend on experiences in the post-Corona crisis | A comprehensive cross-sectional survey was developed in collaboration with several EE stakeholders (destination management office and cultural institution) as well as public health- and tourism experts. |
| Van de Watering, 2022 | AA of EAA | The role of enterprise architecture-driven dynamic capabilities and operational digital ambidexterity in driving business value under the COVID-19 shock. | Firms that have developed their EA-driven dynamic capabilities can handle and proactively address the exogenous COVID-19 shock and adjust accordingly. | An architecture governance model to promote transparency by adopting a common language amongst stakeholders and prioritizing the IT landscape planning process, considering the most critical business processes and the firm's dynamic capabilities. | Contemporary firms should strive for a dual digital approach to operational capabilities to bring the highest degree of business value. |

Source: Author Conceptualisation, 2023