

Transaction cost theory, organisational ambidexterity, and digital platforms: an interpretative case study exploring the implementation of a business-to-business logistics digital platform in a South African organisation

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Abstract

Logistics costs represent a significant burden within South Africa's consumer packaged goods (CPG) manufacturing and retail supply chains. Amidst intensifying market competition and the pressing need for cost reduction, businesses are turning to digital platforms as a solution to optimise logistics efficiency while considering environmental sustainability. Despite the increasing interest in Business-to-Business (B2B) logistics digital platforms, limited case studies exist that explore their early-stage implementation, particularly in emerging markets.

This paper examines the implementation of a B2B logistics digital platform within a South African CPG company, using Transaction Cost Theory (TCT) and Organisational Ambidexterity as theoretical lenses. Through semi-structured interviews and an interpretative case study approach, this study investigates how the platform has enabled cost reductions and enhanced operational efficiencies. The findings reveal that the successful implementation of such platforms depends on a sustainable commercial model underpinned by reliability, trust, and transparency. The study also highlights the critical role of organisational ambidexterity in navigating the challenges posed by digital platform implementation in emerging markets.

Introduction

Background and Motivation

The logistics sector in South Africa is a vital component of the economy, particularly in the consumer packaged goods (CPG) industry. However, this sector faces significant challenges, including high transportation costs, inefficiencies in supply chain operations, and a fragmented logistics infrastructure. In response to these challenges, companies are increasingly adopting digital platforms to streamline logistics processes and reduce costs. Digital platforms offer the potential to revolutionise the logistics sector by enabling better coordination, improving transparency, and fostering competition among service providers.

Despite the potential benefits, the successful implementation of digital platforms in emerging markets like South Africa is fraught with challenges. These include technological limitations, resistance to change among stakeholders, and the need for robust governance structures to ensure transparency and trust. This study explores the implementation of a B2B logistics digital platform in a South African CPG company, focusing on how the platform has been leveraged to lower route-to-market costs and improve operational efficiency. The study also examines the organisational capabilities required to overcome the challenges associated with digital platform implementation in an emerging market context.

Research Objectives

This study aims to address the following research questions:

1. How can a digital platform lower route-to-market costs for the South African CPG and retail industries?
2. What are the key challenges and success factors in the implementation of a digital platform in the logistics sector?
3. How does organisational ambidexterity influence the successful implementation of digital platforms?

The objectives of this study are to evaluate the impact of the digital platform on logistics costs and efficiency, identify the key factors that contribute to successful platform implementation, and assess the role of organisational ambidexterity in navigating the challenges associated with digital platform adoption.

Structure of the Paper

The paper is structured as follows: Section 2 reviews the relevant literature on digital platforms, Transaction Cost Theory, and Organisational Ambidexterity. Section 3 outlines the research methodology, including the case study approach and data collection methods. Section 4 presents the findings of the study, highlighting the key challenges and success factors in the implementation of the digital platform. Section 5 discusses the implications of the findings for theory and practice, while Section 6 concludes the study with managerial recommendations and suggestions for future research.

Literature Review

Logistics Platforms and Outsourcing Benefits

The logistics sector has increasingly turned to digital platforms to optimise the movement of goods and reduce costs. These platforms facilitate outsourcing by connecting businesses with third-party logistics providers, enabling more efficient and cost-effective operations. Digital platforms offer several benefits, including reduced transaction costs, improved operational efficiency, and enhanced collaboration among supply chain partners.

Existing studies demonstrate that digital platforms can lead to significant cost savings through optimised vehicle utilisation, reduction in empty backhauls, and improved coordination of logistics activities (Hsiao et al., 2010; Guo et al., 2022). Moreover, these platforms enhance transparency in the supply chain by providing real-time visibility into logistics operations, enabling businesses to respond more swiftly to market demands. The integration of digital technologies within supply chains is shown to reduce lead times, improve inventory management, and ultimately enhance customer satisfaction (Rossignoli, 2009; Qian et al., 2021).

While the benefits of digital platforms are well-documented, their successful implementation in emerging markets remains underexplored. Emerging markets often present unique challenges, such as infrastructural limitations, regulatory constraints, and socio-economic disparities, which can hinder the effectiveness of digital platforms. This study seeks to contribute to the literature by examining the implementation of a logistics digital platform in the South African context, addressing these under-researched challenges.

Platform Characteristics and Transaction Cost Theory (TCT)

Digital platforms are characterised by their ability to enable interactions between agents, reduce transaction costs, and leverage network effects. Transaction Cost Theory (TCT) offers a valuable framework for understanding how digital platforms can economise on transaction costs by aligning transactions with appropriate governance structures (Williamson, 1981; Bakos, 1998). TCT posits that transaction costs—costs incurred in making an economic exchange—can be minimised through the use of digital platforms that enhance information flow, standardise contracts, and establish transparent processes.

Platforms achieve these efficiencies by reducing uncertainties and fostering trust among participants through mechanisms such as reputation systems and performance metrics (Zhou et al., 2022; Lehdonvirta

et al., 2019). Furthermore, platforms can mitigate opportunistic behaviors by providing standardised procedures for dispute resolution and ensuring that all transactions are conducted within a framework of mutual accountability.

However, the application of TCT to digital platforms in logistics, particularly in emerging markets, requires further investigation. This study applies TCT to assess the impact of a logistics digital platform on transaction costs within the South African CPG sector, exploring how the platform's characteristics align with the theory's predictions and identifying any deviations that may arise due to the unique market context.

Organisational Ambidexterity

Organisational ambidexterity refers to an organisation's ability to balance the exploitation of existing capabilities with the exploration of new opportunities. This balance is crucial for the successful implementation of digital platforms, as it allows organisations to innovate while maintaining operational efficiency (O'Reilly & Tushman, 2004; Carmeli & Halevi, 2009). Ambidexterity enables organisations to respond to rapid technological changes and evolving market conditions, which are inherent in the deployment of digital platforms.

Research suggests that effective leadership and a supportive organisational culture are essential for fostering ambidexterity (Cenamor et al., 2019; Bell & Hofmeyr, 2021). Leaders must encourage experimentation and risk-taking, while simultaneously ensuring that core business processes remain stable and efficient. In the context of digital platforms, organisational ambidexterity is particularly important for managing the tensions between traditional business models and the new opportunities presented by digital transformation.

This study examines the role of organisational ambidexterity in the implementation of a logistics digital platform in a South African CPG company. It explores how the organisation balanced the need to innovate with the need to maintain operational stability, and how this balance influenced the success of the platform's implementation.

Research Methodology

Approach and Philosophy

This study adopts an interpretivist philosophy, which is grounded in the belief that reality is socially constructed and best understood through the subjective experiences of individuals involved in the research context (Myers, 2019). The qualitative case study approach is particularly suited for this study, as it allows for an in-depth exploration of the complex dynamics involved in the implementation of a digital platform within its real-life context. The case study approach also facilitates the understanding of the contextual factors that influence the implementation process, making it ideal for studying the specificities of the South African market.

Data Collection

Data were collected through a series of nine semi-structured interviews with key stakeholders involved in the implementation of the logistics digital platform. These stakeholders included members of the top management team (TMT), logistics managers, IT personnel, and external service providers. The semi-structured nature of the interviews allowed for flexibility, enabling the interviewees to discuss issues most pertinent to their roles while also covering the core themes related to transaction costs, platform characteristics, and implementation challenges.

The interviews were conducted via online videoconferencing, a choice driven by the need to accommodate the schedules and geographical locations of the participants. In addition to the interviews, documentary evidence provided by the participants was reviewed, including internal reports, meeting minutes, and technical documentation related to the platform's implementation.

Analysis Techniques

The interview transcripts and documentary evidence were analysed using NVivo, a qualitative data analysis software. The data were coded and categorised into themes that emerged from the research questions, such as cost economisation, platform reliability, and organisational challenges. Thematic analysis was employed to identify patterns and relationships within the data, providing a comprehensive understanding of the factors influencing the success of the digital platform (Braun & Clarke, 2006).

To ensure the reliability of the findings, a rigorous coding process was followed, involving multiple rounds of coding and cross-checking among the research team members. This iterative process helped to refine the themes and ensure that the analysis accurately reflected the data collected. The findings were then synthesised to draw conclusions about the impact of the digital platform and the role of organisational ambidexterity in its implementation.

Case Study and Preliminary Findings on the Implementation of a B2B Logistics Platform in South Africa

Company Background

The focal company in this case study is a leading player in the South African consumer packaged goods (CPG) sector. With an extensive distribution network across the country, the company faced significant logistical challenges, including high transportation costs, inefficiencies due to fragmented services, and underutilised vehicle capacities. The complexity of South Africa's logistics landscape, characterised by varying infrastructure quality and socio-economic disparities, further exacerbated these challenges.

In response to these issues, the company sought to implement a Business-to-Business (B2B) logistics digital platform designed to streamline operations and reduce costs. The platform aimed to address key inefficiencies by optimising the use of transportation assets, enhancing coordination among logistics providers, and providing real-time visibility into logistics processes.

Platform Selection and Implementation

The company selected a B2B logistics digital platform that operates on a reverse auction model. In this model, transportation service providers bid in real-time for delivery contracts, promoting competition and driving down costs. The platform's value proposition was centered on increasing vehicle utilisation rates, reducing empty backhauls, and fostering transparency in pricing.

The implementation process was structured around several key phases:

1. **Stakeholder Engagement:** The company prioritised engaging key stakeholders early in the process, including logistics managers, IT personnel, and external service providers. This engagement was critical to securing buy-in and ensuring that all parties were aligned with the platform's objectives.
2. **System Integration:** Integrating the digital platform with the company's existing Enterprise Resource Planning (ERP) system was a complex but necessary step to ensure seamless data flow and process automation. This integration required close collaboration between the company's IT department and the platform provider.
3. **Pilot Testing:** Before a full-scale rollout, the company conducted pilot tests in selected regions. These tests were designed to identify and address potential technical issues, refine the platform's functionality, and ensure that the system could handle the demands of real-world operations.

The implementation process was not without challenges. The company encountered technical issues related to the platform's auction capabilities and integration features, as well as data availability problems due to inconsistent internet connectivity in some areas. Additionally, resistance to change among internal staff and external service providers, who were accustomed to traditional logistics processes, posed significant obstacles.

Challenges and Solutions

Several challenges emerged during the implementation of the logistics digital platform:

- **Technical Issues:** The platform's initial software had deficiencies that affected its auction capabilities and integration with the ERP system. To address these issues, the company worked closely with the platform provider to implement necessary upgrades and ensure compatibility with existing systems.
- **Data Availability:** Inconsistent internet connectivity in certain regions limited access to real-time data, which is crucial for the platform's transparency and efficiency. To mitigate this issue, the company invested in mobile data solutions and collaborated with local Internet Service Providers (ISPs) to improve connectivity.
- **Resistance to Change:** There was notable resistance from both internal staff and external service providers, who were hesitant to transition from traditional logistics methods to a digital platform. The company responded by conducting extensive training sessions, demonstrating the benefits of the new system, and implementing change management strategies to ease the transition.

Despite these challenges, the platform was implemented, leading to significant improvements in logistics efficiency and cost reduction. However, whilst the platform itself generated benefits, the TMT demonstrated an inability to apply organisational ambidexterity and focussed on the legacy business without adequate ongoing support to develop and sustain the platform.

Outcomes and Benefits

The platform functions as a B2B reverse auction digital marketplace, or freight exchange platform, where buyers and sellers of freight transport services transact and agree the required service, such as time of service, freight volume, source and destination within South Africa, and related pricing. The platform generates revenue through a success-based transaction fee when supply and demand is matched on the platform.

The implementation of the logistics digital platform resulted in several key benefits for the company:

- **Cost Savings:** The reverse auction model facilitated competitive bidding among transportation service providers, leading to lower transportation costs. Improved vehicle utilisation and reduced empty backhauls further contributed to cost savings.
- **Efficiency Gains:** The platform streamlined administrative processes by automating tasks that previously required manual intervention, reducing the time and effort required to manage logistics operations.
- **Enhanced Transparency:** The platform provided real-time visibility into transportation operations and pricing, fostering trust and confidence among stakeholders. The reputation management system, which allowed users to rate and review their experiences, played a crucial role in building this trust.

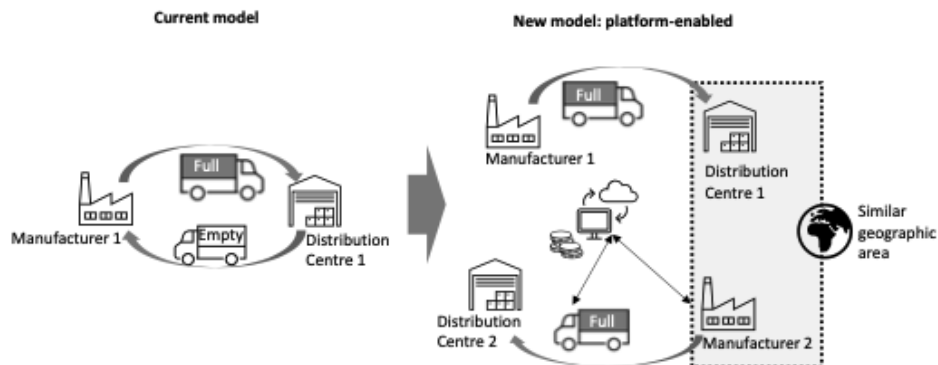


Figure 1: Outcomes and benefits comparison of current and platform model

The present configuration focuses on reducing waste in the market's primary transport sector, particularly on the backhaul leg of transport routes in which vehicles often return unloaded, as illustrated in Figure 1. By applying technology to interact with agents digitally – from orders to processing algorithms, fleet management, and transaction conclusion – the platform is designed to provide an end-to-end logistics service for manufacturers, taking full responsibility for their logistics and related administrative requirements.

Analysis of Findings

Cost Economisation and Efficiency

The study found that the logistics digital platform enabled significant cost economisation through improved vehicle utilisation and reduced administrative costs. By leveraging the reverse auction model, the platform facilitated transparent and competitive pricing, which further enhanced cost savings. Participants noted that the platform's ability to match supply and demand in real-time significantly reduced idle times and increased overall operational efficiency.

The digital nature of the platform also streamlined administrative processes, reducing the need for manual interventions and paperwork. This automation not only lowered operational costs but also minimised the risk of human errors, leading to more accurate and timely transactions. The findings align with existing literature on the benefits of digital platforms in logistics, supporting the view that these platforms can drive significant efficiency gains (Hsiao et al., 2010; Guo et al., 2022).

Success Factors for Platform Implementation

Key success factors for the platform's implementation included the platform's reliability, the trust it built among users, and its transparency in operations. These characteristics were essential for attracting and retaining platform agents, ensuring the platform's effectiveness. The platform's reputation management system, which allowed users to rate and review their experiences, was particularly effective in building trust among participants.

In a traditional logistics environment, the administrative burden is significant. The platform's ability to process large volumes of data rapidly and consistently, providing real-time access to information and data analytics, was a critical factor in reducing transaction costs and improving working capital management. This capability allowed agents to reduce their own administrative expenditures by outsourcing these activities to the platform, thereby obtaining similar or enhanced capabilities at a lower cost.

The findings underscore the importance of technology in reducing workload and driving efficiencies, which are increasingly important as companies pursue cost reduction strategies.

Challenges Encountered

The organisation faced several challenges during the platform's implementation, including technical deficiencies in the acquired software, socio-economic factors affecting data availability, and resistance to change within the industry. Technical challenges included the need to upgrade the platform's auction capabilities and integrate it securely with existing systems. These issues were addressed through close collaboration with the platform provider and ongoing system refinements.

Socio-economic challenges, such as limited access to smartphones and reliable internet among some users, impacted the platform's real-time data collection and transparency goals. The company explored solutions such as data-free options to address these issues, recognising the unique characteristics of operating in an emerging market.

Resistance to change was another significant challenge, with many in the industry reluctant to adopt new technologies. The company's approach to overcoming this resistance included comprehensive training programs, awareness campaigns, and the demonstration of tangible benefits that the platform offered.

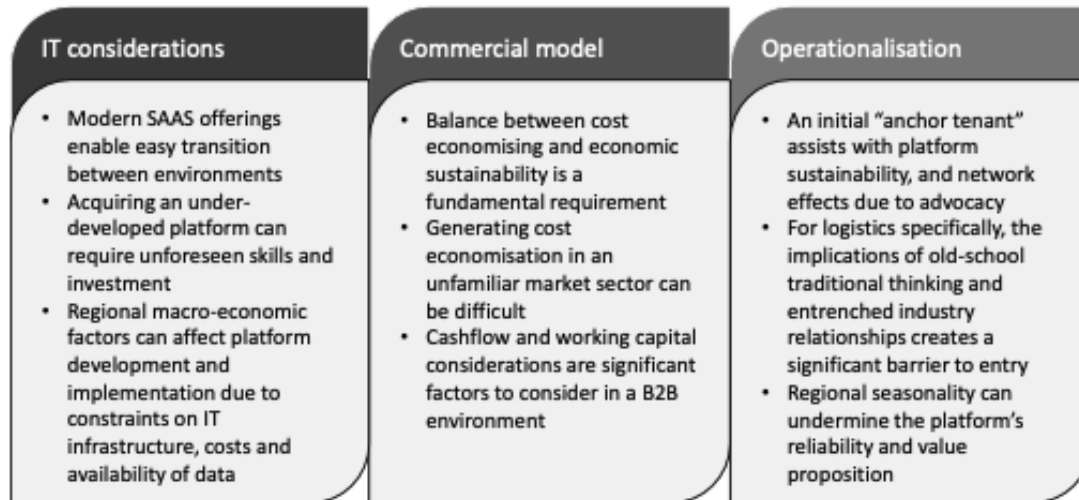


Figure 2: Overview of the findings for implementation successes and challenges

In application development, the narrow phone ecosystem was a key consideration to avoid launching an unusable platform-enabling product. Vehicle drivers, who use the application to update execution progress on the platform, are typically individuals with a lower living standards measure. They often purchase data in prepaid bundles because of personal cash-flow restrictions or insufficient credit, and they often deplete their allocated data at inopportune times and are unwilling or unable to replenish it. The inability to dynamically update the platform directly impacts its transparency and real-time data collection value proposition. Solutions were explored, including data-free options, to address this socioeconomic characteristic related to an emerging market country.

Within a B2C construct, cash-flow and working capital cycles are typically less onerous than for B2B, because consumers transact as individuals in relatively small quantities and have less power than an organisation, which has significantly more resources and purchasing power. In addition, consumers typically pay immediately or on delivery using bank cards, cash, or other means. Credit facilities, if offered, are between the consumer and their funding provider rather than the consumer and the platform. Within a B2B environment, this dynamic alters significantly. Corporate entities demand extended payment terms to manage their working capital values and have strict governance structures covering payment transactions, whilst service providers look to the platform to provide shorter payment terms. This dynamic creates a nonneutral cash-flow implication for the platform, introducing risk for which it is neither designed nor willing to accept. Although potential solutions such as bridging finance services, which increase transaction costs, were considered, this major challenge remains unresolved.

Finally, the platform experienced various challenges in growing the platform agent base because the market, including group companies, did not fully understand the business or its value proposition. Major obstacles causing this problem within the South African logistics industry were "traditional thinking", resistance to change and, in a B2B environment, the requirement for high service levels and reliability which are guaranteed by longer-term contracts and relationships. Drawing platform agents away from entrenched relationships and contracts was therefore difficult.

Discussion and Conclusion

Interpretation of Findings

The findings of this study underscore the significant potential of digital platforms to transform logistics operations, particularly in the context of the South African CPG industry. The successful implementation of the logistics digital platform resulted in considerable cost savings and efficiency gains, which are consistent with the predictions of Transaction Cost Theory (TCT). The platform's ability to

reduce transaction costs through improved vehicle utilisation and competitive bidding aligns with TCT's assertion that digital platforms can economise on transaction costs by enhancing information flow and standardising processes (Williamson, 1981; Bakos, 1998).

However, the study also reveals that the implementation of digital platforms in emerging markets like South Africa presents unique challenges that are not fully addressed by TCT. The socio-economic context, including infrastructural limitations and varying levels of digital literacy, significantly impacted the platform's performance. These findings suggest that while TCT provides a valuable framework for understanding the cost-saving potential of digital platforms, it must be supplemented with considerations of the local context to fully capture the complexities of platform implementation in emerging markets.

The role of organisational ambidexterity emerged as a critical factor affecting the platform's success. A company's ability to balance the exploration of new digital opportunities with the exploitation of existing logistics capabilities is essential in navigating the challenges of implementation. This balance would have allowed the company to innovate while maintaining operational stability, which is crucial in a rapidly changing technological environment (O'Reilly & Tushman, 2004; Carmeli & Halevi, 2009). Unfortunately, the TMT was unable to effectively achieve this balance. The platform was implemented and generated the benefits inherent in the model, however the TMT demonstrated insufficient ambidexterity post the platform launch to ensure sustainability of the initiative. A recent status review of the platform indicates that it has been wrapped into the legacy business and no sales have taken place via the platform. This supports the findings that a platform business will likely fail within a legacy business if there is a lack of organisational ambidexterity.

Theoretical Contributions

This study makes several theoretical contributions to the literature on digital platforms and logistics. First, it extends the application of Transaction Cost Theory to the context of digital platforms in emerging markets, highlighting the need to consider local socio-economic factors in addition to transaction cost economisation. Second, the study demonstrates the importance of organisational ambidexterity in the successful implementation of digital platforms, particularly in environments characterised by rapid technological change and market uncertainty.

The integration of TCT and organisational ambidexterity provides a comprehensive framework for understanding the factors that influence the success of digital platform implementations. This framework can be applied to other contexts, offering insights into how organisations can effectively manage the tensions between innovation and operational stability.

Managerial Recommendations

Based on the findings of this study, several recommendations can be made for managers seeking to implement digital platforms in the logistics sector:

1. **Build Trust and Transparency:** Managers should prioritise building trust among platform users by ensuring transparency in operations and pricing. The use of reputation management systems, where users can rate and review their experiences, is particularly effective in fostering trust.
2. **Address Technical and Socio-Economic Challenges:** Managers must be proactive in addressing technical issues and socio-economic challenges that may arise during platform implementation. Investing in robust IT infrastructure and ensuring reliable internet connectivity are essential steps in overcoming these challenges.
3. **Foster Organisational Ambidexterity:** To navigate the complexities of digital platform implementation, managers should foster organisational ambidexterity by encouraging innovation while maintaining focus on core operational capabilities. This requires a supportive organisational culture and leadership that is committed to balancing exploration and exploitation activities.
4. **Invest in Training and Change Management:** Resistance to change is a common barrier to the adoption of digital platforms. Managers should invest in comprehensive training programs and change

management strategies to ease the transition and ensure that all stakeholders are aligned with the platform's objectives.

Limitations and Future Research

While this study provides valuable insights into the implementation of a logistics digital platform in South Africa, it is not without limitations. The study focuses on a single case, which limits the generalisability of the findings. Future research should explore additional cases across different regions and industries to validate the findings and assess their applicability in other contexts.

Moreover, this study relied on qualitative methods, which, while valuable for in-depth exploration, could be complemented by quantitative approaches in future research. Surveys or longitudinal studies could provide additional insights into the long-term impacts of digital platforms on logistics performance and supply chain sustainability.

Future research could also examine the role of digital platforms in promoting sustainable logistics practices, particularly in the context of emerging markets. As businesses increasingly prioritise environmental sustainability, understanding how digital platforms can contribute to greener logistics operations will be an important area of study.

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