



BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF COMMERCE

DEPARTMENT OF ECONOMICS

**TRANSFORMING SUPPLY CHAINS THROUGH DIGITALIZATION: AN ANALYSIS
OF KEY ELEMENTS, CHALLENGES, ENABLERS AND PERFORMANCE METRICS:
A CASE STUDY IN TELECOMMUNICATION COMPANIES (ECONET WIRELESS,
NETONE AND TELECEL ZIMBABWE).**

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**THIS DISSERTATION IS SUBMITTED IN A PARCIAL FULFILMENT OF THE
REQUIREMENTS OF THE BACHELOR OF HONOURS DEGREE
IN PURCHASING AND SUPPLY**

MAY 2025

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TITLE PROJECT : TRANSFORMING SUPPLY CHAINS THROUGH DIGITALIZATION: AN ANALYSIS OF KEY ELEMENTS, CHALLENGES, ENABLERS AND PERFORMANCE METRICS: A CASE STUDY IN TELECOMMUNICATION COMPANIES (ECONET WIRELESS, NETONE AND TELECEL ZIMBABWE).

PROGRAMME : BACHELOR OF COMMERCE (HONOURS) DEGREE IN PURCHASING AND SUPPLY

YEAR GRANTED : 2025

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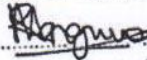
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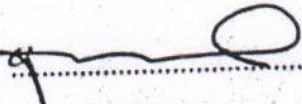
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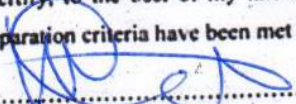
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DEDICATION

I dedicate my humble effort to my father, dear loving mother, three sisters and friends whose daily prayers, love and compassion have enabled me to achieve such accomplishment and honour. I also dedicate my work to my supervisor Mr Pande. You all have been a pillar of strength to me and you taught me the value of having a strong heart and mind. I pray for radical grace upon your lives. Thank you and may the Lord richly bless you.

ABSTRACT

The rapid advancement of digital technologies is fundamentally reshaping global supply chains, making them more interconnected, responsive and data-driven. This dissertation investigates the transformative potential of digitalization within the supply chains of Zimbabwe's telecommunications sector, focusing on three major players which are Econet Wireless, NetOne and Telecel. The study explores key elements, challenges, enablers and performance metrics associated with digital transformation, aiming to provide actionable insights for improving operational efficiency, customer satisfaction and competitiveness. The research focused on two groups of employees at the three companies particularly Supply Chain Experts and Digitalization Specialists Experts. Data was gathered through questionnaires and document analysis with participants selected using purposive sampling. Notably, the study achieved an 88% response rate from the distributed questionnaires, ensuring a thorough and comprehensive collection of data. This approach provided valuable insights into the research study in the Telecommunication companies on Transforming Supply Chains through Digitalization. The findings show that all three companies have made progress toward digitalization but remain only partially digitalized. The companies shared challenges include limited budgets, aging infrastructure and resistance to change while company-specific issues like digital skills gaps at Telecel and infrastructure limitations at NetOne further complicate the process. Technologies such as Artificial Intelligence (AI), the Internet of Things (IoT) and Enterprise Resource Planning (ERP) stand out as having the greatest potential to revolutionize supply chain operations. Success in digital transformation however, depends on strong leadership, a culture of innovation and effective partnerships with technology vendors. The study also introduces a localized framework of performance metrics including Key Performance Indicators (KPIs), Return on Investment (ROI) and customer satisfaction so as to track the impact of these digital initiatives. In conclusion, while Zimbabwe's telecom companies have taken significant steps toward digital transformation, achieving full digitalization will require strategic investment, workforce training and collaboration across organizations. This research provides valuable insights for both academics and industry stakeholders, offering a detailed analysis of digital supply chain transformation in an emerging market. Future studies could explore the role of advanced technologies like blockchain and machine learning as well as expand the scope to include other sectors.

ACKNOWLEDGEMENT

I would like to extend my gratitude to God Almighty for the gift of life, good health and wisdom that He granted me to complete this project. I extend also my heartfelt gratitude to Bindura University of Science and Education for granting me the opportunity to pursue a Bachelor of Honours Degree in Purchasing and Supply. I am deeply appreciative of the lecturers who selflessly shared their expertise throughout the program. Their teachings have equipped me to address numerous business challenges encountered in my organization and the insights gained will remain invaluable in both my personal and professional endeavors. I would also like to express my sincere thanks to my employer for their unwavering support both financially and by granting me the necessary time to focus on my studies. This achievement would not have been possible without their encouragement and understanding.

Special recognition goes to Mr Pande for his unwavering guidance and mentorship during the completion of my dissertation. His expertise and encouragement were instrumental in ensuring my research met the rigorous standards of the graduate school. I am equally grateful to my fellow students whose camaraderie and support kept me motivated especially during challenging moments when I struggled to keep pace. Lastly, I owe a profound debt of gratitude to my family for their boundless love and patience. Despite the countless hours I dedicated to my studies which often came at the expense of time with them, their support never wavered. This accomplishment is as much theirs as it is mine.

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ACROYNM

IoT -Internet of Things

AI- Artificial Intelligence

ERP- Enterprise Resource Planning

KPIs- Key Performance Indicators

ROI- Return on Investment

SCM- Supply Chain Management

NPS- Net Promoter Score

IT- Information Technology

CSAT- Customer Satisfaction Score

SPSS- Statistical Package for the Social Sciences

CHAPTER ONE

INTRODUCTION

1.0 Introduction

The global business landscape is undergoing a significant shift, largely fueled by the widespread adoption of digital technologies. This "digital revolution" is fundamentally altering industries, and its influence is particularly pronounced on supply chains. These are becoming increasingly intricate, interconnected, and global in nature (Christopher, 2016). Digitalization offers a potent means to overhaul these complex networks, fostering greater efficiency, transparency, responsiveness, and resilience (Hofmann et al., 2017). By utilizing technologies like cloud computing, the Internet of Things (IoT), and advanced analytics, businesses can optimize their supply chain operations, cut costs, and boost customer satisfaction (Ivanov & Dolgui, 2020). This dissertation examines the transformative potential of digitalization within supply chains, with a specific focus on the telecommunications sector in Zimbabwe. The study will investigate the key elements, challenges, enablers, and performance metrics associated with digitalizing supply chains, using Econet, NetOne, and Telecel as case studies.

1.1 Background of the study

Supply chains have evolved in tandem with broader trends in globalization and technological progress. Initially characterized by simple, linear processes, they have transformed into highly integrated and intricate systems, spanning multiple countries and involving a multitude of stakeholders (Handfield & Nichols, 2002). The rise of the internet and e-commerce has further accelerated this evolution, generating new opportunities for efficiency and collaboration, while also introducing increased risks (Lee & Tang, 2003).

Globally, the incorporation of digital technologies has become a primary driver of supply chain transformation. Companies are deploying technologies such as Enterprise Resource Planning

(ERP) systems, Supply Chain Management (SCM) software and advanced analytics to enhance visibility, optimize inventory levels, and improve decision-making (Stadtler, 2015). The integration of IoT devices allows for real-time tracking and monitoring of goods, while blockchain technology provides enhanced transparency and security (Kshetri, 2018). The COVID-19 pandemic underscored the importance of resilient and agile supply chains, accelerating the adoption of digital solutions to mitigate disruptions and adapt to evolving market conditions (World Economic Forum, 2021).

In Africa, the digitalization of supply chains is gaining momentum, spurred by rapid technological progress and rising mobile penetration. The International Telecommunication Union (ITU) reports substantial growth in mobile connectivity across the continent, which is essential for enabling digital supply chain solutions (ITU, 2021). Countries such as Kenya and Nigeria have emerged as frontrunners in technological innovation, with services like M-Pesa transforming transaction methods and supply chain financing (Jack & Suri, 2011). Nonetheless, the continent grapples with significant challenges, including infrastructure shortcomings and regulatory obstacles. Many areas continue to struggle with poor road networks and inconsistent internet access, which can hinder the effective application of digital technologies (Aker & Mbiti, 2010). Additionally, the regulatory environment varies greatly among African nations, affecting the speed of digital adoption and innovation (OECD, 2020).

In Zimbabwe, the telecommunications sector has experienced substantial growth and transformation, driven by increasing mobile phone penetration, internet access, and the demand for data services. This growth is evident in the rising mobile subscriber base, although recent economic challenges have impacted affordability and usage (POTRAZ, 2023). Zimbabwe's telecommunications market is dominated by three major players: Econet, NetOne (a state-owned enterprise), and Telecel. These companies operate in a demanding environment, marked by economic instability, currency fluctuations, and logistical constraints (IMF, 2023). The country has faced periods of high inflation and currency volatility, creating significant difficulties for businesses and impacting the ability to import necessary equipment and components (Reserve Bank of Zimbabwe, 2023). This has put considerable strain on the supply chains of telecommunication companies, requiring them to manage complex flows of equipment, components, and services to meet the needs of a rapidly expanding customer base. These supply

chains are critical for ensuring the timely availability of network infrastructure, handsets, SIM cards, and other essential products and services.

In addition, the telecommunications sector plays a crucial role in advancing the digitalization of supply chains. The nation has encountered economic difficulties, such as hyperinflation and currency instability, which have tested the resilience of various sectors. Despite these challenges, the telecommunications industry has demonstrated adaptability and innovation, laying the groundwork for digital initiatives (ZimStats, 2022). The key players such as Econet, NetOne, and Telecel are vital in providing communication services that facilitate digital transformation. For example, Econet has broadened its offerings to include mobile banking and e-commerce platforms, enhancing operational efficiency and customer interaction (Econet Annual Report, 2023). Likewise, NetOne concentrates on increasing mobile internet access, enabling businesses to effectively implement digital solutions (NetOne Strategic Plan, 2022).

Telecel is also advancing in digital engagement, employing digital channels to analyze consumer behavior and refine supply chain decisions. The collaboration among these companies underscores the importance of telecommunications in creating a digital ecosystem that nurtures supply chain innovation. However, challenges persist, including inadequate infrastructure, regulatory barriers, and a skills gap within the workforce (World Bank, 2021). Research by Mhlanga (2020) indicates that insufficient digital literacy and technical skills among employees significantly hinder the effective adoption of digital tools.

However, traditional supply chain models in Zimbabwe and indeed in many developing economies, frequently encounter significant challenges. These include inefficiencies resulting from manual processes, fragmented information systems, and limited visibility across the supply chain (Mentzer et al., 2001). The absence of real-time data and tracking capabilities hinders the ability to monitor inventory levels, identify bottlenecks, and respond proactively to disruptions (Lee & Billington, 1993). Furthermore, limited collaboration among different stakeholders, including suppliers, distributors, and internal departments, can exacerbate existing problems (Lambert & Cooper, 2000).

The Zimbabwean telecommunications sector is at a crucial juncture. To remain competitive and meet the needs of a growing customer base hence, companies must embrace digital transformation

and modernize their supply chain operations. This requires investment in technologies that can improve efficiency, transparency, and resilience. There are some indications of this already, with some Zimbabwean telcos investing in digital platforms for customer service and mobile money (Financial Gazette, 2023). The adoption of digital platforms can facilitate better inventory management, reduce lead times, and improve customer service.

Additionally, regulatory frameworks significantly influence the digital transformation of supply chains. The Zimbabwean government has introduced policies aimed at creating an environment conducive to technology adoption in the telecommunications sector. One such initiative is the National Digital and Cyber Security Strategy, which seeks to strengthen the security and integrity of digital transactions—an essential factor for building consumer trust and stimulating investment in digital supply chain solutions (Zimbabwe Ministry of ICT, 2022). Nonetheless, inconsistencies in regulation and bureaucratic challenges may hinder progress, illustrating the need for a more streamlined approach to policy execution.

The importance of human capital in the context of digital transformation should not be underestimated. The successful implementation of digital technologies within supply chains demands a skilled and adaptable workforce. Research indicates that a considerable skills gap exists in Zimbabwe, with many employees lacking the digital literacy and technical expertise required to effectively utilize new technologies (Mhlanga, 2020). Therefore, training and development initiatives focused on improving digital skills will be critical for ensuring that the workforce is prepared to meet the challenges of a digitally transformed supply chain.

Moreover, partnerships within the telecommunications ecosystem are becoming increasingly vital. Collaborations among telecom companies, technology providers, and educational institutions can drive innovation and promote the sharing of resources and expertise (Chae, 2019). Such partnerships could lead to the creation of customized solutions addressing specific sector challenges, thereby enhancing the overall efficiency and robustness of the supply chain. Additionally, fostering connections with local startups and tech firms can introduce new and innovative approaches to supply chain management, further advancing the digital transformation agenda.

Finally, as technological advancements continue to evolve, consumer behavior is also changing, resulting in higher expectations for seamless digital experiences. As consumers grow more accustomed to digital interactions, telecommunications companies must adjust their supply chain strategies accordingly. This adaptation includes improving service delivery, enhancing product availability, and utilizing data analytics to better understand customer preferences (Porter & Heppelmann, 2014). By aligning their supply chain operations with consumer expectations, companies can boost customer satisfaction and loyalty, ultimately supporting sustained growth in a competitive environment.

1.2 Statement of the problem

The Zimbabwean telecommunication sector which are Econet, NetOne and Telecel faces a significant problem which is a lag in supply chain digitalization, leading to operational inefficiencies, reduced competitiveness and decreased customer satisfaction (Christopher, 2016). This is particularly concerning given rapid technological advancements and evolving customer expectations. The underutilization of digital technologies, resulting in issues like poor inventory management and slow order processing thus hindering these companies' ability to compete (Gunasekaran & Ngai, 2004). The root causes of these problems include, outdated systems and infrastructure, skills gap, financial constraints, organizational resistance to change and regulatory challenges. This impacts all supply chain stages, from procurement to customer service especially in areas with limited digital infrastructure. The problem is worsening, as customer expectations rise and competitors leverage digital technologies. The longer this problem continues, the more these companies will fall behind. The stakeholders being affected are customers, companies themselves, shareholders, employees, suppliers and the Zimbabwean economy. The ideal situation or solution is for each company to have a fully digitalized and integrated supply chains thus, featuring real-time visibility, automated processes, data-driven decision-making, a skilled workforce and improved responsiveness. (Porter and Heppelmann 2014) highlighted on the transformative power of smart products as they change competition thus, encouraging telecommunication companies to embrace these technologies to stay competitive in the Market.

1.3 Purpose of the Study

The purpose of the paper is transforming supply chains through digitalization: An analysis of key elements, challenges, enablers and performance metrics. A case study in telecommunication companies (Econet wireless, NetOne and Telecel Zimbabwe).

1.4 Research Objectives

- i. To compare the current state of supply chain digitalization across Econet, NetOne and Telecel.
- ii. To identify and evaluate the key challenges hindering digital supply chain implementation.
- iii. To assess the potential of various digital technologies to transform the supply chains.
- iv. To develop a framework of performance metrics to measure the impact of digitalization initiatives.

1.6 Statement of the hypothesis

Adoption of digitalizing supply chains at Econet, NetOne, and Telecel Zimbabwe significantly boosts their operational effectiveness, leading to measurable improvements in key performance indicators (KPIs) like cost savings, inventory efficiency, and customer satisfaction.

1.7 Significance of the study

Industry Impact

This research offers practical insights for Zimbabwean telecommunication companies seeking to optimize their supply chains through digitalization. By examining the specific challenges and opportunities within the local context, the study provides a roadmap for implementation, ultimately enhancing competitiveness and operational effectiveness in a rapidly evolving market. This contributes to the overall growth and resilience of the Zimbabwean telecommunications sector, a vital part of the national economy. The findings will help these companies make informed decisions about technology investments and process improvements.

Economic Contribution

The study's focus on how digitalization impacts operational efficiency and cost reduction directly contributes to understanding how technology can stimulate economic growth within Zimbabwe's telecommunications sector. This sector is a significant contributor to the country's GDP and improvements in supply chain management can lead to lower operating costs, improved service delivery and increased investment. This research provides evidence-based insights that can inform policy decisions and promote a more competitive business environment.

Academic Value

This dissertation enriches the existing body of knowledge on supply chain digitalization, particularly within the context of emerging markets. By providing empirical evidence from the Zimbabwean telecommunications industry the research validates and builds upon existing theoretical frameworks. The study offers a localized perspective on the challenges and enablers of digital transformation contributing to a more nuanced understanding of the topic. The findings can inform future research and provide a valuable case study for academics and students.

1.8 Assumptions

The researcher assumes that:

- they will be adequate and relevant data (financial, operational, customer-related) accessible from the participating telecom companies.
- the selected companies will cooperate by providing necessary information and facilitating data collection access
- the companies possess a basic technological infrastructure and digital skills to support their digitalization efforts.

1.5 Research Questions

- i. What is the current level of digitalization and how do the companies compare?
- ii. What specific challenges does each company face in digitalizing its supply chains?
- iii. Which digital technologies offer the greatest potential for transformation?

- iv. How can a robust set of performance metrics be developed and utilized to effectively measure the impact of digital supply chain initiatives?

1.9 Delimitations

- The research was limited to Zimbabwean telecom companies (Econet, NetOne, and Telecel), and the findings may not apply elsewhere.
- The research analysis was restricted to a specific and manageable timeframe (e.g., past 3-5 years).
- The research was primarily concentrating on a defined set of digital supply chain technologies, like cloud computing and data analytics.

1.10 Limitations

- Restricted access to sensitive company data for example detailed financials could limit the analysis's depth.
- Small sample size of the three companies may limit how broadly the findings can be applied to the entire Zimbabwean telecom sector.
- Qualitative data for example interviews and surveys may be influenced by biases and individual interpretations.
- The study may not fully account for external influences especially economic instability on supply chain performance.
- The rapid evolution of digital technologies may make the findings somewhat time-sensitive.

1.11 Definition of terms

Digitalization

Digitalization is the integration of digital technologies into business processes including supply chain management to improve efficiency, reduce costs and aid decision-making.

Supply Chain

Supply Chain is the network of organizations, activities, information, and resources involved in delivering a product or service from supplier to customer.

Operational Efficiency

Operational efficiency is a company's ability to perform its functions effectively with minimal waste.

Key Performance Indicators (KPIs)

Key Performance Index is measurable values showing how well a company achieves its business objectives for example cost reduction, inventory turnover and customer satisfaction.

Cloud Computing

Cloud computing is delivering computing services for example servers and storage over the internet to offer flexibility and scalability.

1.12 Summary

The part examined how digitalization transforms the supply chains of Econet, NetOne, and Telecel Zimbabwe by analyzing key aspects, challenges, and performance measures within these telecom companies. The research part was aiming to reveal the potential of digital technologies to boost operational efficiency, reduce costs, and improve customer satisfaction. The research was aiming to contribute to both industry practice and academic understanding by providing a localized perspective on successful digital supply chain implementation in an emerging market. While the study has limitations, including data access and sample size, it was expected to provide valuable insights into digital transformation in Zimbabwe's telecom sector. The following chapter shall entirely focus on discussing related literature.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter examines the existing literature on the digital transformation of supply chains, with a particular focus on Zimbabwe's telecommunications sector. It addresses key elements, challenges, enablers and performance metrics relevant to this transformation. Companies such as Econet, NetOne, and Telecel face distinct local challenges while seeking to utilize advanced technologies like IoT, AI, and big data analytics to enhance their efficiency and competitiveness. The objective of this review is to synthesize current research, identify existing gaps and establish a foundation for understanding how these firms can effectively implement digitalization strategies.

2.1 Theoretical Literature

The digital transformation of supply chains is a vital research area, especially within the telecommunications sector where companies such as Econet Wireless, NetOne and Telecel Zimbabwe are working to improve their operational efficiency and competitiveness. This literature review consolidates findings from various studies conducted outside Zimbabwe, emphasizing their relevance to the local context and aligning with my research objectives.

2.1.1 Current State of Supply Chain Digitalization

One significant study by Kamble et al. (2020) examined the current state of supply chain digitalization in India's manufacturing sector. The study aimed to evaluate the extent of digital adoption and its effects on operational performance. The researchers discovered that organizations that embraced digital technologies, including the Internet of Things (IoT) and big data analytics, saw considerable improvements in efficiency, cost savings, and customer satisfaction. This research directly relates to my first objective of comparing the current state of supply chain digitalization among Econet, NetOne, and Telecel. However, while Kamble et al. provide valuable insights into the advantages of digitalization, they do not sufficiently address the distinct

challenges encountered by companies in developing nations like Zimbabwe, including infrastructural limitations, economic instability, and varying levels of technological readiness. Recognizing these limitations, my research aims to offer a more nuanced comparison that takes into account the specific operational contexts of these telecommunications companies ensuring that the findings can be effectively applied in Zimbabwe.

2.1.2 Challenges in Digital Supply Chain Implementation

In another important study, Dubey et al. (2021) identified key obstacles to digital supply chain implementation across various industries, including telecommunications. Their research highlighted challenges such as resistance to change, a shortage of skilled personnel and inadequate technological infrastructure. This aligns closely with my second objective, which focuses on identifying and evaluating the challenges faced by Econet, NetOne and Telecel in their digital transformation journeys. While Dubey et al. provide a thorough overview of these challenges, their findings primarily originate from developed economies and may not fully reflect the complexities and cultural nuances of the Zimbabwean context. For example, the cultural factors influencing employee resistance in Zimbabwe could differ significantly from those in more developed markets, where change management strategies may be more effective. Therefore, while I value the insights provided by Dubey et al., my research will explore the specific challenges faced by these companies in Zimbabwe, offering a localized perspective on digital supply chain implementation that is crucial for developing effective solutions.

2.1.3 Potential of Digital Technologies

According to Wang et al. (2022) evaluated the potential of various digital technologies, including artificial intelligence (AI) and blockchain, to transform supply chains in the logistics sector. Their objective was to analyze how these technologies could enhance operational processes, improve decision-making, and increase transparency. They found that organizations utilizing these technologies reported better performance metrics and operational efficiency. This study is highly relevant to my third objective of assessing the potential of digital technologies to transform the supply chains of Econet, NetOne, and Telecel. However, while Wang et al. present persuasive evidence of the advantages of these technologies, they do not adequately address the barriers to

adoption that may exist in developing countries, such as high implementation costs, limited access to advanced technologies, and insufficient digital literacy among the workforce. My research will build on their findings by investigating how these technologies can be effectively integrated into the supply chains of Zimbabwean telecommunications companies, taking into account the local challenges and opportunities that could impact their adoption and implementation.

2.1.4 Framework for Performance Metrics

Kumar et al. (2023) proposed a framework for performance metrics to evaluate the effectiveness of digital initiatives within supply chains. Their study aimed to develop key performance indicators (KPIs) that organizations can use to assess their digital transformation efforts, emphasizing metrics such as operational efficiency, customer satisfaction, and agility in adapting to market changes. While their work provides a solid foundation for my fourth objective of creating a performance metrics framework, I believe their approach may not fully encapsulate the unique operational realities of Zimbabwean telecommunications companies. For instance, their KPIs focus on generic metrics without accounting for specific local challenges, such as regulatory compliance, market volatility, and the need for adaptability in a rapidly changing economic environment. My study will enhance their framework by incorporating metrics that reflect the distinct challenges and opportunities faced by Econet, NetOne and Telecel, ensuring that the performance indicators are both relevant and actionable within the Zimbabwean context.

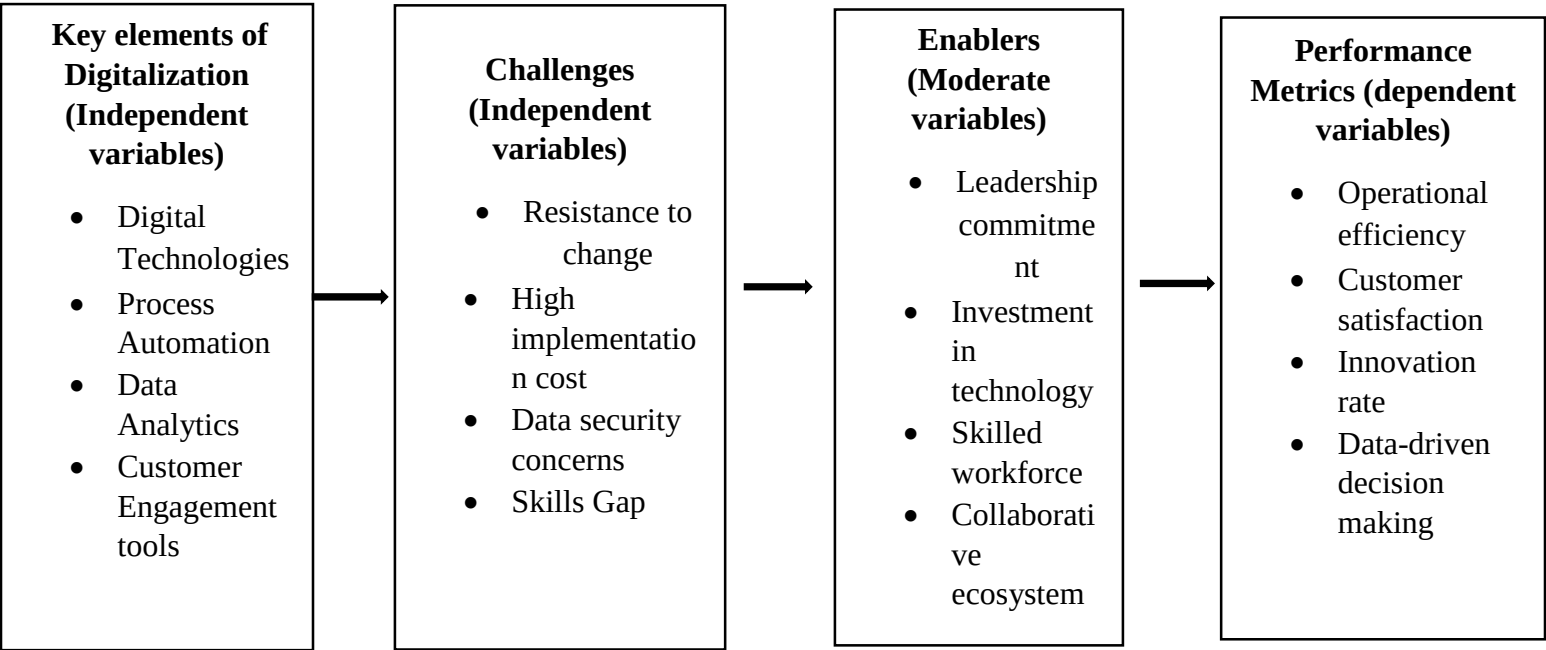
2.1.5 Enablers of Digital Transformation

Zhang et al. (2024) investigated the enablers of digital transformation in supply chains, concentrating on organizational culture, leadership, and technological readiness. Their objective was to identify factors that promote successful digital initiatives. They found that a supportive organizational culture and strong leadership are essential for creating an environment conducive to digital innovation. While their findings highlight the significance of these enablers, they do not specifically address how these factors interact with the challenges identified in earlier studies. For instance, while strong leadership can propel digital initiatives, it could also heighten resistance if not coupled with effective change management strategies. My research will integrate these enablers into a comprehensive framework that considers both the challenges and opportunities for

digital transformation in Zimbabwe’s telecommunications sector, ultimately striving for a more holistic understanding of how to navigate the complexities of digitalization within a unique socio-economic context.

2.2 Conceptual framework

2.2.0 Table 1: Framework of performance metrics that effectively measures the importance of digital initiatives in the Telecommunication sector.



Source: Researcher (2025)

The conceptual framework designed for analyzing performance metrics in the realm of digital initiatives within the supply chains of telecommunications firms, specifically Econet Wireless, NetOne, and Telecel Zimbabwe, encompasses a range of interconnected components that illustrate the multifaceted nature of digital transformation. This framework not only serves as a valuable guide but also provides insights into how various factors contribute to the overall effectiveness and success of digital initiatives within this dynamic sector

2.2.1 Key Elements of Digitalization in Supply Chains

Central to this framework are the key elements of digitalization which encompass advanced digital technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), Big Data analytics, process automation, and customer engagement tools. As noted by Porter, M.E., & Heppelmann, J.E (2020), IoT facilitates the gathering of extensive data from a multitude of connected devices, leading to improved decision-making processes and enhanced operational efficiencies. AI enhances these capabilities by automating various processes and delivering predictive analytics, which empower companies to anticipate shifts in market trends and respond effectively to customer demands. Furthermore, Big Data analytics plays a pivotal role in converting raw data into actionable insights, thereby significantly boosting strategic planning and execution (Wang, Y. et al. 2021). Additionally, customer engagement tools are essential for nurturing and maintaining relationships with clients, enabling personalized experiences that can enhance customer loyalty and satisfaction. These elements work synergistically to create a robust digital ecosystem that drives innovation and efficiency in supply chain operations.

2.2.2 Challenges of Digitalization in Supply Chains

Notwithstanding the potential advantages, several challenges can obstruct the successful implementation of digital initiatives within supply chains. A prominent challenge is resistance to change, which often arises from organizational inertia and a limited understanding of the capabilities offered by digital tools (Kotter, J. P. 1996). Employees may harbor fears regarding job security or may be hesitant to embrace new technologies, which can result in suboptimal utilization of available digital resources. (Kotter, J. P. 2022) revisits his famous eight-step process for leading change, highlighting the necessity of establishing a sense of urgency and forming a guiding coalition. He asserts that successful change initiatives demand strong leadership and effective communication, along with a dedication to nurturing a culture that welcomes change rather than resists it. Kotter points out that many organizations struggle in their transformation efforts due to insufficient employee engagement and a lack of alignment between the change vision and the organization's core values. Ultimately, he reiterates that effective change management is crucial for organizations to adapt and succeed in a rapidly changing business landscape. Furthermore, high implementation costs can act as a significant barrier, particularly for smaller enterprises, as the initial financial outlay for technology adoption can be considerable (Brynjolfsson, E., & McAfee, A. 2021). Additionally, data security concerns present another layer of complexity, as

organizations must navigate the intricate landscape of safeguarding sensitive information in an increasingly digital world. More so, the pervasive skills gap within many organizations can obstruct the successful adoption of digital technologies; a workforce lacking essential skills may find it difficult to effectively leverage digital tools, impeding overall performance and innovation (Bessen, J. E. (2020).

According to (Zeng, J., & Huang, W 2023) provided critical insights into the complexities of digital transformation faced by telecommunications companies. They identify several challenges, including outdated legacy systems, regulatory hurdles, and the significant financial investment required for new technologies. To successfully navigate these challenges, the authors advocate for comprehensive strategies that integrate not only technological upgrades but also essential changes in organizational culture and workforce skills. They emphasize the importance of collaboration with technology partners and the necessity of continuous innovation as vital components of a successful transformation. Additionally, Zeng and Huang underscore the need for customer-centric approaches which leverage data analytics to enhance customer experiences and personalize services. The paper also highlights the pivotal role of emerging technologies, such as 5G, IoT, and AI, in driving operational efficiency and improving service delivery. Furthermore, the authors address the regulatory landscape, noting that telecommunications companies must adeptly navigate complex regulations while advancing their digital initiatives, as these can significantly impact their overall transformation efforts. Overall, this reference sheds light on the multifaceted challenges and strategic pathways that telecommunications firms must consider in an increasingly dynamic technological environment.

2.2.3 Enablers of Digitalization in Supply Chains

To effectively address these challenges, certain enablers must be established. Foremost among these is leadership commitment, which is essential for driving effective change management. Support from top management is crucial, as it can cultivate an organizational culture that embraces digital transformation (Kane, G. C. et al., 2020). Moreover, substantial investment in technology is critical for equipping teams with the tools they need to thrive in a digital environment. A skilled workforce is equally vital; ongoing training and professional development initiatives can help bridge existing skills gaps, ensuring that employees are proficient in utilizing digital technologies effectively. Lastly, creating collaborative ecosystems can greatly enhance innovation and

knowledge sharing. Partnerships with other organizations can provide additional resources and expertise, thereby facilitating a smoother navigation through the complexities associated with digital transformation (Chesbrough, H. 2020). This collaborative approach not only strengthens organizational capabilities but also fosters a culture of continuous improvement and adaptability.

2.2.4 Performance Metrics of Digitalization in Supply Chains

The ultimate objective of this framework is to establish robust performance metrics that accurately measure the impact of digital initiatives. Key metrics include operational efficiency, which evaluates the improvements achieved in terms of time and cost reductions attributable to the implementation of digital tools. Customer satisfaction, often assessed through Net Promoter Score (NPS) and Customer Satisfaction Score (CSAT), serves as a reflection of the effectiveness of customer engagement strategies implemented by the organization. Additionally, the innovation rate, which measures the number of new services or products launched, acts as an indicator of an organization's agility and responsiveness to shifting market demands. Finally, data-driven decision-making underscores the importance of employing data analytics to inform strategic choices, thereby enhancing overall business performance and competitive advantage (McAfee, A., & Brynjolfsson, E. 2022). These metrics collectively provide a comprehensive assessment of the effectiveness and impact of digital initiatives on organizational performance.

2.3 Empirical Literature

The empirical framework surrounding the digital transformation of supply chains, particularly in the telecommunications sector, has gained significant attention in recent years. This body of literature provides valuable insights relevant to my study on Econet Wireless, NetOne, and Telecel Zimbabwe, which aims to analyze key elements, challenges, enablers, and performance metrics associated with digitalization. The integration of digital technologies into supply chain processes is increasingly recognized as essential for achieving operational excellence and maintaining a competitive edge in a rapidly evolving marketplace. As organizations strive to adapt to changing consumer expectations and technological advancements, understanding how digital tools can enhance supply chain efficiency becomes critical.

2.3.1 Comparative Analysis of Digitalization

One notable study by Moyo et al. (2022) focused on comparing the current state of supply chain digitalization across the three telecommunications companies in Zimbabwe. Their objective was to assess the extent of digital adoption and its impact on operational efficiency. Utilizing a mixed-methods approach that combined quantitative surveys and qualitative interviews, the researchers discovered that Econet had made substantial progress in digitalization, while Telecel lagged significantly behind. This study is particularly relevant to my first objective, as it provides a foundational understanding of the varying levels of digital maturity among these companies. Moyo et al. emphasized the importance of digital tools in enhancing customer service and operational speed. However, while they present a clear comparison, they fail to delve deeply into the underlying factors driving these disparities, such as organizational culture, technology investment, and management support. Addressing this gap is critical, as understanding these factors could inform targeted strategies for enhancing digital transformation, which is precisely what my research seeks to explore. By investigating these underlying elements, my study aims to provide a more comprehensive view of how each company can leverage its strengths and address weaknesses in the digital landscape.

2.3.2 Challenges in Digital Supply Chain Implementation

In another significant study, Chikozho and Nyoni (2023) aimed to identify and evaluate the key challenges hindering digital supply chain implementation in Zimbabwe's telecommunications sector. Their qualitative research involved interviews with industry stakeholders and thematic analysis, revealing barriers such as employee resistance, inadequate technological infrastructure, and high costs associated with digital initiatives. These findings resonate strongly with my second objective of evaluating challenges, as they highlight the multifaceted nature of obstacles that companies face in their digital transformation journeys. However, I contend that their study could benefit from a more nuanced exploration of how these challenges specifically affect each company's digital initiatives. For example, while they highlight resistance to change, they do not analyze how varying levels of employee training and support influence this resistance. By recognizing their contributions, I appreciate the importance of their findings, but I also emphasize the need for a more detailed analysis that considers the unique operational contexts of Econet,

NetOne, and Telecel, which my research aims to provide. A deeper understanding of these challenges will facilitate the development of tailored strategies that can effectively address the specific barriers faced by each company.

2.3.3 Potential of Digital Technologies

Dlamini and Chirwa (2024) assessed the potential of various digital technologies, including the Internet of Things (IoT), artificial intelligence (AI), and blockchain, to transform supply chains in the telecommunications industry. Their objective was to analyze the effectiveness of these technologies in enhancing operational processes. They identified several case studies demonstrating successful implementations, but their findings primarily focus on theoretical implications without considering the practical challenges faced by companies in Zimbabwe, such as limited access to technology and the existing digital divide. These barriers may hinder the adoption of advanced technologies, rendering their potential benefits inaccessible to many organizations. My research aims to bridge this gap by examining how these technologies can be effectively integrated into the supply chains of Econet, NetOne, and Telecel. By accounting for the specific operational contexts and challenges each company faces, I hope to provide a more actionable framework for leveraging digital technologies in the telecommunications sector in Zimbabwe. This analysis will not only highlight the transformative potential of these technologies but also provide practical recommendations for overcoming barriers to their implementation.

2.3.4 Performance Metrics Framework

The study conducted by Banda et al. (2025) proposed a framework for performance metrics to measure the importance of digital initiatives in telecommunications supply chains. Their study aimed to develop key performance indicators (KPIs) through expert consultations and literature reviews, focusing on metrics like operational efficiency, customer satisfaction, and service delivery speed. While their work provides a solid foundation for my fourth objective of developing a performance metrics framework, I believe their approach may not fully capture the unique operational realities of Zimbabwean telecommunications companies. For example, they emphasize generic KPIs without addressing specific local challenges such as regulatory compliance and market volatility, which can significantly impact performance assessment. My study will expand

on their framework by incorporating specific metrics that reflect the distinct challenges and opportunities faced by Econet, NetOne, and Telecel, ensuring that the performance indicators are not only relevant but also actionable within the Zimbabwean context. By tailoring these metrics to local conditions, my research aims to enhance the effectiveness of digital initiatives in the telecommunications sector.

2.3.5 Enablers of Digital Transformation

Ndlovu and Moyo (2023) explored the enablers of digital transformation in the telecommunications sector, focusing on organizational culture, leadership, and technological readiness. Their objective was to identify factors that facilitate successful digital initiatives. They found that a supportive organizational culture and strong leadership are crucial for fostering an environment conducive to digital innovation. While their findings underscore the importance of these enablers, they do not specifically address how these factors interact with the challenges identified in previous studies. For instance, while strong leadership can drive digital initiatives, it could also exacerbate resistance if not paired with effective change management strategies. My research will integrate these enablers into a comprehensive framework that considers both the challenges and opportunities for digital transformation in Zimbabwe's telecommunications sector. This integration aims to provide a more holistic understanding of how to navigate the complexities of digitalization, ensuring that organizations can harness their strengths while effectively addressing their weaknesses.

2.4 Research Gap

The examination of digital transformation in supply chains within the telecommunications sector, particularly regarding Econet Wireless, NetOne, and Telecel Zimbabwe, reveals several significant research gaps. While existing studies, such as those by Moyo et al. (2022), offer comparative insights, they do not investigate the underlying factors affecting digital transformation within each company. Chikozho and Nyoni (2023) identify challenges but fail to provide a detailed analysis of how these challenges uniquely manifest across the organizations. Moreover, Dlamini and Chirwa (2024) evaluate emerging digital technologies mainly from a theoretical perspective, neglecting practical implementation challenges. Lastly, Banda et al. (2025) suggest a performance metrics framework that does not take into account the specific realities of the Zimbabwean

telecommunications landscape. Addressing these gaps will improve the understanding of digital transformation and result in actionable recommendations for effectively navigating the complexities of digitalization in the sector.

2.5 Summary

This chapter has presented a comprehensive overview related to the digital transformation of supply chains in the telecommunications sector. A variety of subjects have been covered, including scholarly perspectives throughout the world with regards to digital transformation of supply chains. The following chapter will provide an overview of the research methodology adopted for this study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

The previous chapter reviewed relevant literature on the impact of digitalization on supply chains in the telecommunications industry, focusing on Econet wireless, NetOne and Telecel Zimbabwe. This chapter outlines the methodology for data collection aimed at addressing the research questions. It includes discussions on research design, study population, sample, sampling techniques, data collection instruments, data validity and reliability, data analysis, presentation of findings and ethical considerations.

3.1 Research Design

The choice of a case study research design was driven by the understanding that it enables data collection from specific respondents who are knowledgeable about the questions the research aims to address. This study adopted a multiple-case study design to investigate the transformation of supply chains through digitalization in the telecommunications sector, focusing on Econet Wireless, NetOne and Telecel.

3.1.1 Case Study Design

A case study is a research method that focuses on the details of a single individual, group, incident, or community. The decision to use this research design was based on the understanding that case studies allow for data collection from specific respondents who are knowledgeable about the research questions. In this study, the chosen case study facilitated a comparison of experiences and strategies among three telecommunications companies in Zimbabwe: Econet Wireless, NetOne, and Telecel Zimbabwe. This design helped identify best practices, challenges, and opportunities for digitalizing supply chains in the telecommunications sector.

The integration of quantitative and qualitative methods for data collection was chosen due to the advantages associated with both approaches. A case study is particularly effective for gathering information from a large population, as it can collect data from a diverse range of individuals, including those outside the researcher's immediate reach through mailed questionnaires. This method allows for the exploration of people's attitudes, feelings, and beliefs. Child (2006) points out that this approach is commonly used in educational research because it is convenient when controlled experiments with human participants are not possible.

3.1.2 Qualitative research

Qualitative research served as an exploratory approach to understand the digital transformation of supply chains in telecommunications companies specifically Econet Wireless, NetOne, and Telecel Zimbabwe yielding valuable insights into the complexities involved. It provided an in-depth understanding of participants' experiences, offering rich data on key elements, challenges, and enablers of digital transformation. The flexibility of semi-structured interviews allowed researchers to adapt questions and uncover unexpected insights related to digital practices, while also highlighting contextual factors affecting digitalization and its impact on supply chain performance. This approach effectively identified nuanced challenges, such as organizational resistance and financial constraints, often overlooked in quantitative studies, and explored critical enablers like leadership commitment and technological investments essential for successful transformation. Moreover, qualitative data informed the development of performance metrics by revealing stakeholders' priorities for evaluating digital initiatives, fostering collaboration and deepening the understanding of the digital landscape. Ultimately, this study aimed to analyze how telecommunications companies in Zimbabwe could effectively transform their supply chains through digitalization.

3.1.3 Quantitative research

Furthermore, the research opted for quantitative research because it employs a systematic approach that quantifies data and analyzes it using statistical methods, making it especially useful for understanding the transformation of supply chains through digitalization in telecommunications companies such as Econet Wireless, NetOne, and Telecel Zimbabwe. This method presents several

benefits, including objectivity due to its reliance on numerical data and generalizability from employing larger sample sizes. It also enables the use of advanced statistical techniques to uncover relationships between variables, particularly regarding the impact of digitalization on supply chain performance metrics. Moreover, quantitative research aids in developing clear, measurable performance indicators that facilitate the assessment of digital transformation over time and supports trend analysis to illustrate how digitalization affects efficiency, cost reduction, and customer satisfaction. Additionally, it allows for comparative studies across different companies or time periods, yielding insights into best practices and areas for improvement. The findings can be effectively visualized through graphs and charts, enhancing the understanding for stakeholders. By utilizing quantitative research, I aimed to thoroughly analyze the key elements, challenges, enablers, and performance metrics associated with digitalization in telecommunications supply chains. Ultimately, since the study was self-funded, the researcher chose to employ quantitative methodologies based on the belief that large volumes of data could be collected at a very low cost.

3.2 The Target Population

The target population for the study on transforming supply chains through digitalization in telecommunications companies specifically Econet Wireless, NetOne, and Telecel Zimbabwe consists of key stakeholders engaged in the supply chain processes within these organizations. The researcher shall use two groups to conduct the research. The first group are Supply Chain Experts especially professionals with hands-on experience in managing supply chains, including supply chain managers, logistics coordinators, procurement specialists and inventory managers. They can provide insights into current supply chain operations, challenges and potential benefits of digitalization. The second group are Digitalization Specialists especially experts in digital technologies, including IT managers, digital transformation specialists, data analysts and software developers. They can offer insights into potential digitalization, implementation challenges and relevant performance metrics. This varied target population will enhance the understanding of the key elements, challenges, enablers, and performance metrics associated with digitalization in the supply chains of these telecommunications companies. Due to constraints such as cost, space, time, and limited resources, the researcher was unable to gather information from all employees, highlighting the necessity for a sample.

3.3 Sample and Sampling techniques

Given the varied target population for the study on transforming supply chains through digitalization in telecommunications companies specifically Econet Wireless, NetOne, and Telecel Zimbabwe, a sampling approach was necessary for effective data collection as it enables the handling of complex data. The researcher employed purposive and stratified random sampling techniques to carry out the study. Thirty (30) Supply Chain Experts and Ten (10) Digitalization Specialists will be included in the sample. The Thirty (30) Supply Chain Experts will be selected using stratified sampling. To choose the ten (10) Digital specialist, the researcher will also use purposive sampling. The total sample size will be approximately (40) participants, with careful attention to the number of key stakeholders in each category to guarantee adequate representation. In clarifying purposive sampling, Kidd and Kral (2015) noted that the researcher's judgement is the only factor used to choose participants who are thought to be competent about the subject of the study. Richard (2020) defines purposive sampling as the process of selecting participants for a sample with a specific goal in mind. The researcher indicated that the administrative perspectives and experiences of Supply Chain Experts and Digitalization Specialist may be particularly important for this study.

3.4 Research Instruments

3.4 Research Instruments

3.4.1 Questionnaire

A questionnaire is an effective research tool for gathering data related to the transformation of supply chains through digitalization in telecommunications companies. This tool consists of a series of structured questions aimed at efficiently collecting information from respondents. In this research, a questionnaire was designed for both the Supply Chain Experts and Digitalization Specialists. One of the primary advantages of using a questionnaire is its standardization, which guarantees that each respondent answers the same questions, thereby ensuring consistency in data collection and analysis. Additionally, questionnaires can collect both quantitative and qualitative data by including closed-ended questions for statistical analysis and open-ended questions for deeper insights into respondents' opinions about the topic under evaluation. Another benefit is the ease of distribution as questionnaires can be administered online or in paper format, making it convenient to reach a wide range of stakeholders across different departments. Moreover,

questionnaires are typically more cost-effective than other data collection methods, such as interviews or focus groups, especially when involving a large number of participants. The anonymity that questionnaires provide encourage respondents to share honest answers, resulting in more reliable data. Time efficiency is also a significant advantage, as respondents can complete questionnaires at their convenience, which may increase participation rates. Finally, the structured nature of questionnaires simplifies data entry and analysis, particularly when using statistical software. Overall, employing a questionnaire in this research will facilitate the collection of diverse and valuable insights from key stakeholders, enhancing the understanding of the digital transformation process in supply chains. The benefit of this approach is that all elements of the objectives were documented and analyzed to yield responses relevant to the research goals. Furthermore, the questionnaire was designed specifically with the study's unique aims in consideration.

3.4.2 Document analysis

Document analysis is a qualitative research method that involves systematically reviewing and interpreting existing documents to collect relevant information on specific topics, such as the digital transformation of supply chains in telecommunications companies. This method provides access to a wealth of data, including reports, policy papers, and internal communications, which allows for a comprehensive understanding of current practices and strategies. It offers historical context by showing how practices have changed over time and is typically more cost-effective than primary data collection methods like interviews or surveys. Furthermore, document analysis is non-intrusive, enabling researchers to conduct their work without direct interaction with participants, thus reducing response bias. It can also complement other research methods through data triangulation, improving the validity and reliability of the findings. By identifying patterns and trends, this approach supports in-depth exploration of digitalization strategies, and the ready availability of documents facilitates efficient data collection. In summary, document analysis is a valuable tool for gaining insights and contextualizing the digital transformation process in supply chains.

3.5 Data collection procedure

The data collection procedure for this research on the digital transformation of supply chains in telecommunications companies comprised several essential steps. Initially, companies were selected based on criteria such as size, the extent of digital initiatives, and their relevance to the research objectives, ensuring a variety of experiences. I am seeking authorization to conduct research at the three telecommunications companies and will describe the academic nature of the study after finalizing the data collection tools. A pilot research phase was conducted to evaluate the applicability and relevance of the study instruments before their implementation in the final data collection rounds. The pilot study aimed to determine the time required for distributing the questionnaire. Data was collected using one instrument at a time. The quantitative questionnaire was first distributed, followed by the analysis of documents.

3.6 Data Analysis

Data analysis is the organized process of examining, cleaning, transforming, and modeling data to uncover valuable insights, draw conclusions, and aid in decision-making. It employs various techniques and methodologies that are customized based on the data's characteristics and the specific questions being explored. The Statistical Package for the Social Sciences (SPSS) was utilized to collect, clean, and analyze quantitative data, while qualitative data was examined through thematic analysis. All gathered data was organized into themes for analysis, which were then reviewed to provide insights relevant to the study's objectives. The findings from these two analytical methods enriched the overall understanding of the data. The analysis followed a logical sequence of steps. Initially, worksheets were employed to collect and compile the data. To enhance clarity, SPSS was used to display the data in graphs, figures, and tables, illustrating the relationships between variables. Subsequently, conclusions were drawn by comparing the results with the empirical data.

3.7 Data presentation

Quantitative data produced by SPSS was displayed in graphs, tables, and charts. The benefit of using these visual representations is that they clearly define variables, allowing readers to comprehend the information more effectively. Descriptive qualitative data was presented through

narratives and quotations. The advantage of using narratives and quotations is their flexibility, as they can encompass all responses from participants.

3.8 Reliability and validity

Validity refers to the degree to which research findings or measurements accurately reflect the intended concept or phenomenon. In essence, validity evaluates the truthfulness, accuracy and relevance of research results. Regardless of the approach taken in a study, the results must be valid, reliable, and credible. The researcher employed various methods for data collection to ensure authenticity and reliability. Reliability refers to the consistency and accuracy of research findings, measurements or results. It evaluates whether the research method, instrument or procedure produces consistent results over time, across different researched or different contexts. Additionally, different strategies can be utilized to enhance reliability, such as consistently coding data and reviewing transcripts for errors. The quantitative questionnaire was carefully coded, clearly outlining variables, and the data underwent thorough cleaning to ensure the study's reliability. To guarantee dependability, the study implemented all of the recommended practices mentioned above.

3.9 Ethical considerations

This research was shaped by various ethical considerations. Research ethics encompasses the standards and guidelines that differentiate acceptable behaviors from unacceptable ones in the realm of research. Research ethics ensure the safety and security of data sources and researchers. The following guiding principles were followed throughout the study process. Before each interview, participants received a clear explanation of the research objectives and the expected time, effort, and questions involved. Respondents were informed of their right to accept or decline participation in the study. During and after data collection, the researcher ensured that the names and information of the respondents would be kept strictly confidential. The research findings will be made publicly accessible whenever necessary.

3.10 Summary

This chapter outlines the methodology and the handling of data, as well as the actual data collection process. Consideration was also given to research ethics. The study results will be presented in the following chapter.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This section aims to assess and review the outcomes of the research. It will start with a brief overview of the sample followed by a summary of the conclusions drawn from the research questions and objectives. These conclusions are based on findings from both document analysis and the questionnaire. A cross-case analysis method will be employed to present, analyze and interpret the data. As the chapter progresses, the data will converge to provide a comprehensive understanding and address the research objectives. Additionally, the first part of the subsequent section will include the biodata and its implications.

4.2 Questionnaire Response

The first phase of the research was conducted through questionnaires. A total of Forty (40) questionnaires were distributed to two groups of employees which are Supply Chain Experts and Digitalization Specialists of the three Companies Econet, NetOne and Telecel

N = 40

Respondents	Number of questionnaires issued	Number of questionnaires completed	Response rate (%)
35	40	35	88
Total	40	35	88

4.1 Table 2: Questionnaire's response rate

Source: Primary data, 2025

Not all the respondents managed to complete the questionnaire as indicated on the table, hence the result is satisfactory to the researcher.

4.2.1 Distribution of the participants by professional qualifications

The researcher posed a question that required respondents to specify their level of education in relation to their profession. Specifically, they were asked to indicate their qualifications from a list of options provided. Table 2 clearly illustrates the qualifications held by the respondents.

N = 35

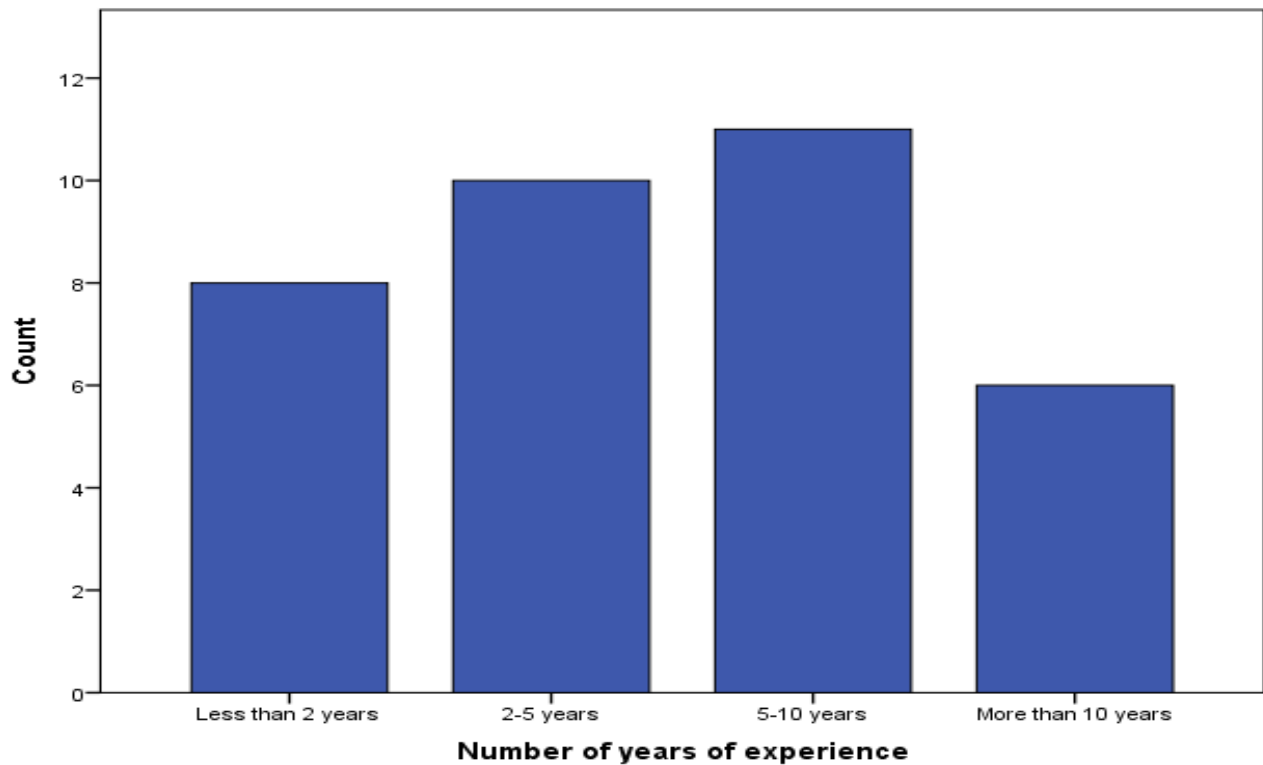
Level of qualification	Frequency	Percentage (%)
Undergraduate degree	16	46
Post graduate degree	14	40
College diploma	5	14
‘A’ Level and ‘O’ Level Certificate	0	0
Total	35	100

4.2 Table 3: Distribution of respondents by qualification

Source: Primary data, 2025

The table presents the distribution of Econet, NetOne and Telecel’s Supply Chain Experts and Digitalization Specialists based on their qualifications. According to the data, 46% of the participants hold undergraduate degrees, while 40% possess postgraduate degrees and the remaining 5% have diplomas. Notably, there are no participants with basic Ordinary or Advanced Level qualifications. This indicates that the participants were purposefully selected, making them well-suited for the study.

4.2.2 Distribution of respondents by experience



4.1 Figure 1: Distribution of respondents by experience

Source: Primary data, 2025

The length of service and job experience of the respondents are illustrated in Figure 4.1 above. Among the respondents, 23% have less than 2 years of experience. Following this, the 2-5 years of experience group accounts for 29% of the responses. Additionally, 31% of the participants belong to the group with 5-10 years of experience. Moreover, the remaining 17% of the respondents have more than 10 years of experience. The length of service is particularly relevant to this study as it reflects the respondents' familiarity with the company and its operations. Those with more experience are likely to possess greater insights into the company's functioning. Given that a significant portion of the respondents has extensive experience with the firm, their feedback is likely to be more reliable.

4.3 Comparing the current state of Supply Chain Digitalization across Econet, NetOne and Telecel

COMPANY	DIGITALIZATION LEVEL
Econet	Partially Digitalized
NetOne	Partially Digitalized
Telecel	Partially Digitalized

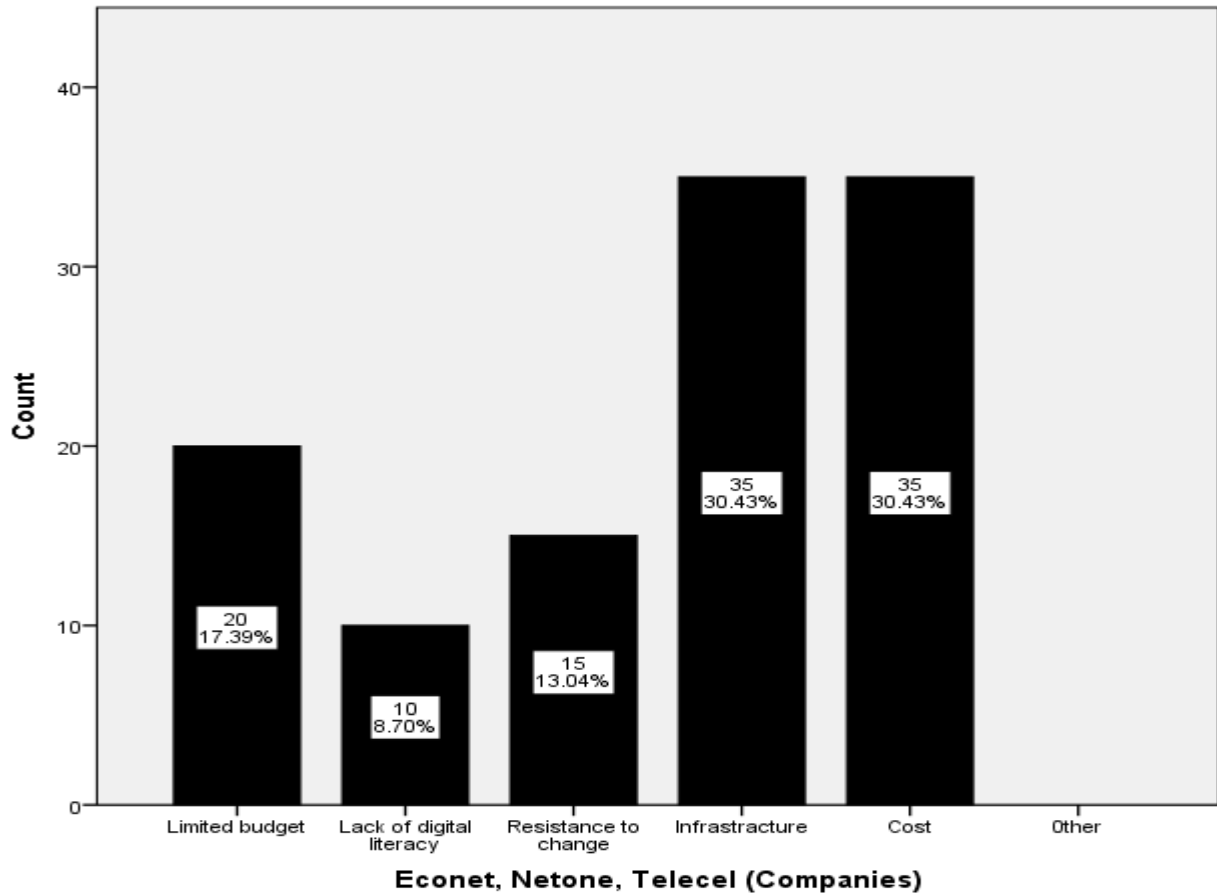
4.3 Table 4 Current level of Digitalization of all Companies

Source: Primary Data 2025

The table 4.3 above shows the current state of Supply Chain Digitalization of all three companies Econet, NetOne and Telecel. The results I obtained from the questionnaire indicated that they have achieved a similar level of digitalization, classified as Partially Digitalized with 100% responses. The findings suggest that the companies are making progress in their digitalization efforts but there is still work to be done to achieve full digitalization. In addition, the companies could explore opportunities for collaboration or knowledge sharing to accelerate their digitalization journey.

From the results above of Econet, NetOne and Telecel of all being partially digitalized indicates factors limiting such as financial resources, leadership and organizational readiness. Recent studies, such as (Vial 2021), highlight that digital transformation occurs at different rates depending on an organization's capacity to manage change and adopt new technologies. Similarly, (Berger et al. 2020) note that partial digitalization is common during transformation as companies must balance innovation with operational constraints. Furthermore, (Brennen and Kreiss 2020) emphasize that even limited adoption of technologies like AI and IoT can enhance supply chain efficiency but achieving full integration requires sustained investment and strategic leadership which differs across these companies.

4.4 Key challenges hindering digital supply chain implementation



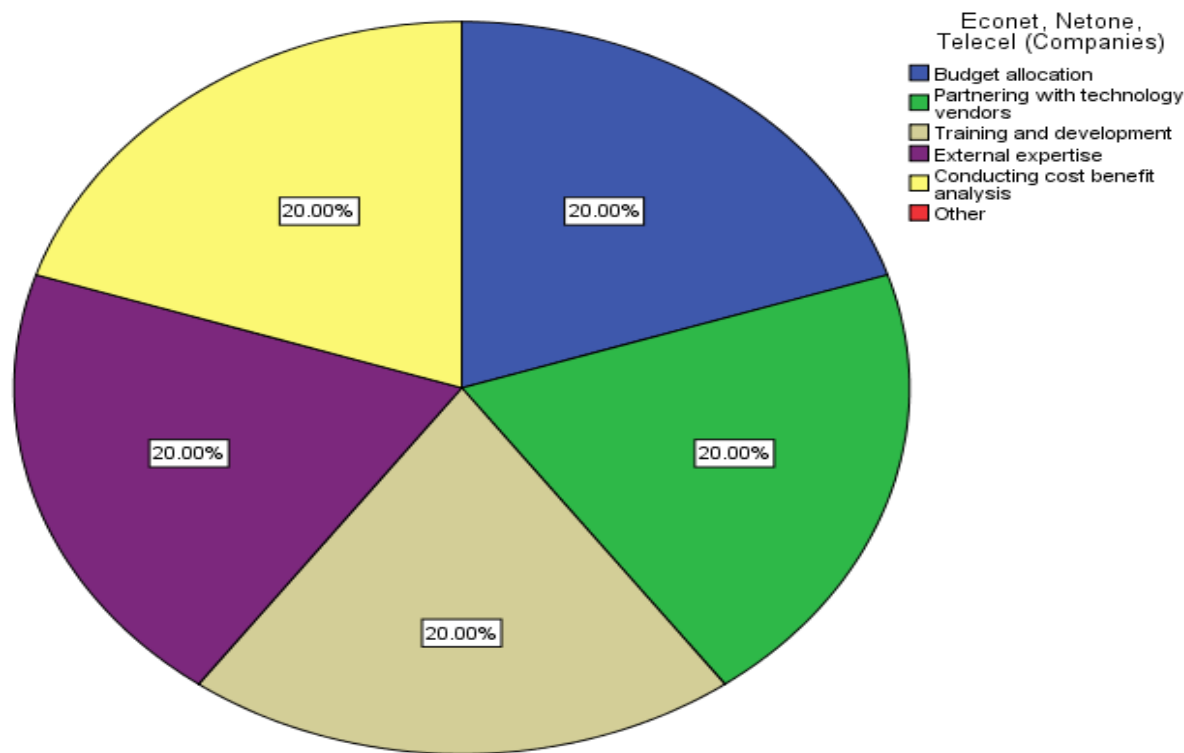
4.2 Figure 2 Key challenges hindering digital supply chain implementation

Source: Primary Data, 2025

Figure 4.2 above is illustrating the key challenges hindering digital supply chain implication. 17.39% of responses facing limited budget belongs to NetOne and Telecel companies. responses with 8.70% belong to Telecel company facing lack of digital literacy among workers. In addition, the 13.04% of the questionnaire responses facing resistance to change belong to Econet company as a challenge. The remaining 61% of responses with 30.43% Infrastructure challenges and another 30.43% Cost challenges are all challenges being faced by all three companies as said by the targeted employees of each of the companies. The above information as illustrated by the graph shows that each company is facing unique challenges in digital supply chain implementation.

According to the results above, Econet struggles with building out its infrastructure and getting everyone on board with change (Gartner 2022) are pretty typical for a company of its size as it is a leading company in terms of digitalization among the three companies. NetOne and Telecel, on the other hand are held back by limited budgets and outdated infrastructure (McKinsey 2023). Telecel also has got to deal with a skills gap among its employees which can make it tough to keep up with the latest digital trends (World Economic Forum 2020). Lastly, not forgetting the cost, implementing and maintaining digital supply chains can be a real financial burden for all three companies (Supply Chain Management Review 2022). Hence, given these challenges, its clear that each company needs a customized approach to digital transformation that takes into account its unique strength and weaknesses (Deloitte 2023).

4.4.1 Solutions to challenges hindering digitalization



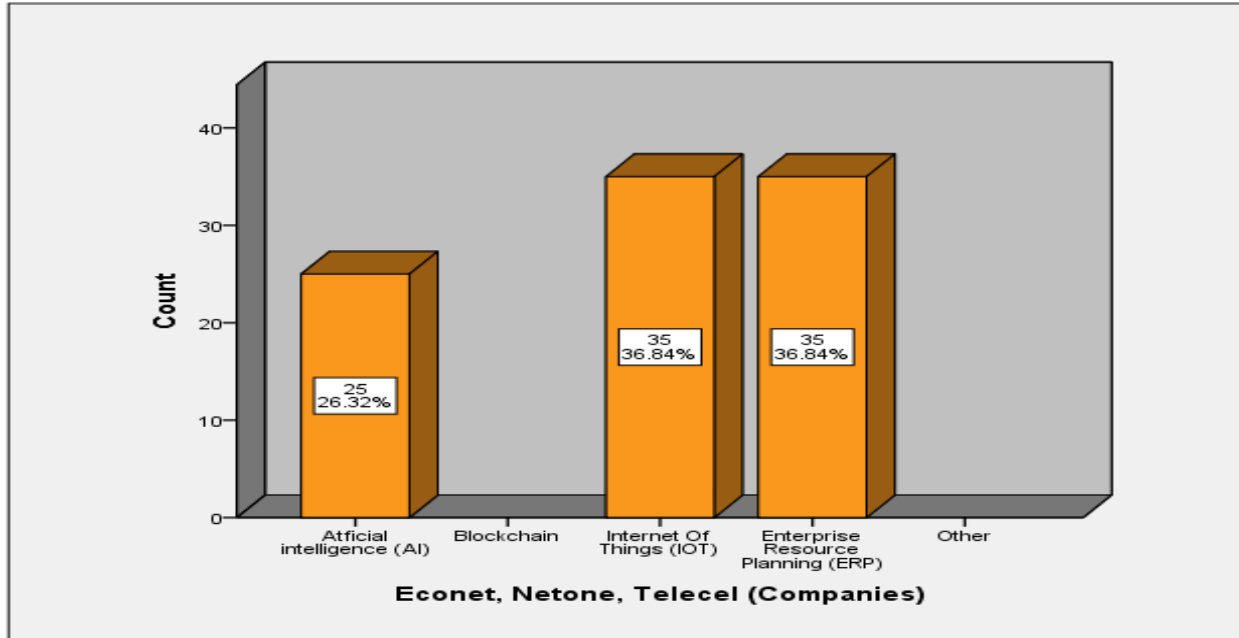
4.3 Figure 3: Solutions to challenges hindering digitalization

Source: Primary data, 2025

The above figure 4.3 is illustrating the solutions to challenges hindering digitalization in the three telecommunication companies. All the 100% on the pie-chart of the responses indicates that Econet, NetOne and Telecel companies are all applying the same solutions to not hinder digitalization implementation which are budget allocation, partnering with technology vendors, training and development, external expertise and conducting cost-benefit analysis. Using results that have been collected to the targeted group that were purposefully selected gives a less biased result of the current solutions being used by each company, thus becoming more reliable for the researcher.

The telecom industry's digital transformation is unfolding in distinct ways for each major player. Econet is at the forefront, investing heavily in infrastructure and digital supply chain initiatives, teaming up with industry giants like Huawei and Ericsson, and upskilling its workforce through comprehensive training programs (Gartner, 2022; Deloitte, 2023). NetOne, while navigating budget constraints, is prioritizing critical infrastructure upgrades and strategic vendor partnerships with ZTE and Huawei, alongside moderate employee training initiatives (McKinsey, 2023). Meanwhile, Telecel is taking a more measured approach due to financial limitations by focusing on cost-effective solutions, vendor collaborations, and foundational digital literacy training, albeit with limited training and analysis (Supply Chain Management Review, 2022).

4.5 Greatest potentials of various digital technologies to transform supply chains.



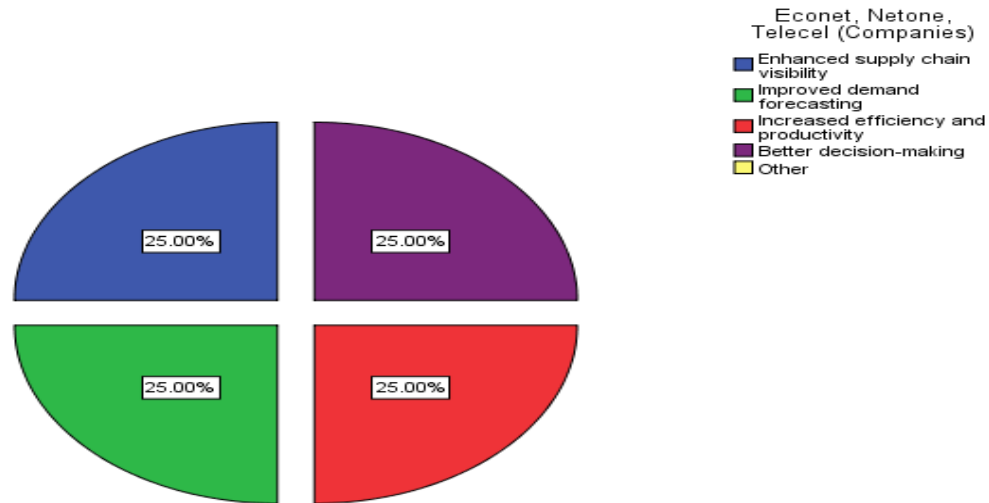
4.4 Figure 4: Greatest potentials of various digital technologies to transform supply chains

Source: Primary data, 2025

The figure 4.4 above is showing the greatest potentials of various digital technologies to transform supply chains. The 26.32% of Artificial intelligence (AI) is a great potential for Econet and Telecel as a result from despondence on my questionnaire so as illustrated from above. Blockchain digital technology has proven to not be the greatest potential for the three companies. 36.84% of the Internet of Things (IOT) digital technology offers a greatest potential for all three companies. Enterprise Resource Planning (ERP) with 36.84% digital technology also offers the greatest potential for the three companies as shown above. This shows commitment by both companies to leverage digital technologies to improve their supply chains.

The top telecom players are poised for transformation. Econet can supercharge its operations with AI, IoT and ERP thus, using AI for demand forecasting and predictive maintenance, IoT for real-time infrastructure monitoring and ERP to streamline processes and boost resource allocation (KPMG, 2022). NetOne despite budget limitations, can still reap benefits from targeted tech like IoT for infrastructure management and ERP for supply chain integration (PwC, 2023). Meanwhile, Telecel's financial constraints hold it back from fully embracing new tech, limiting its potential to moderate gains from small-scale implementations.

4.5.1 Envisioning these technologies improving your supply chain operations



4.5 Figure 5: Envisioning these technologies improving your supply chain operations:

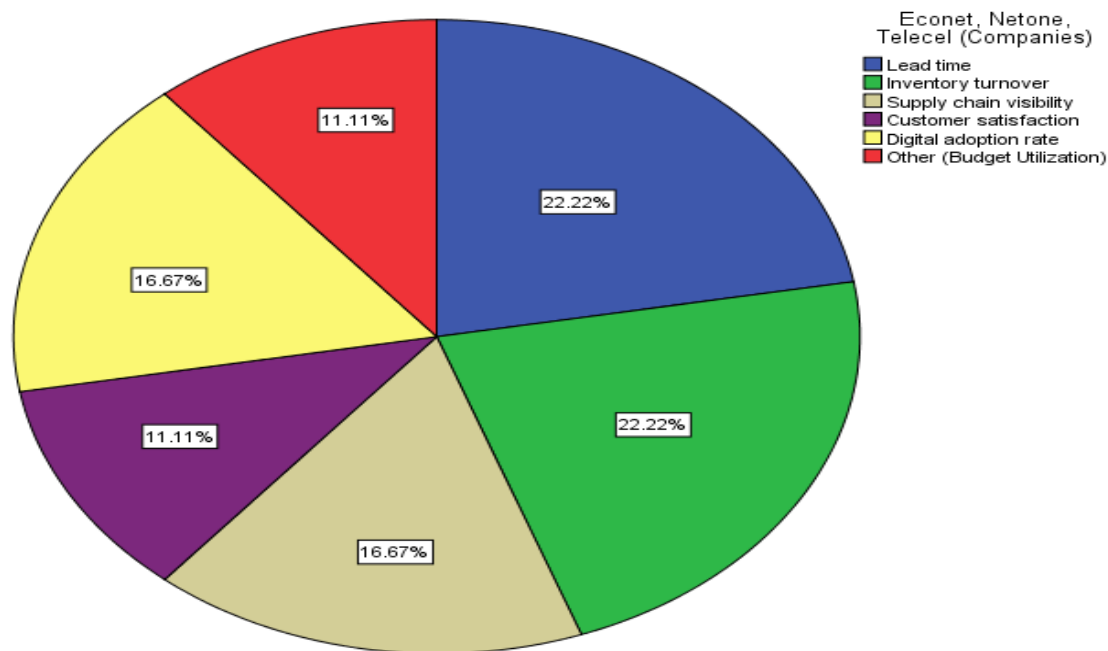
Source: Primary data, 2025

From the above, figure 4.5 shows that 100% of the respondents show that all the three telecommunication companies envision these technologies mentioned above to be improving their supply chain operations. Econet, NetOne and Telecel companies are envisioning enhanced supply chain visibility, improved demand forecasting, increased efficiency and productivity and better decision making as shown on the graph above.

The telecom industry's top players - Econet, NetOne, and Telecel - can revolutionize their operations by embracing cutting-edge tech. Econet can harness the power of IoT and Blockchain to boost supply chain visibility (Manyika et al., 2021), AI to predict customer demand (Bhimani et al., 2023), and ERP and AI to streamline processes and supercharge productivity (Davenport & Dyché, 2022), driving business growth. Meanwhile, NetOne can tap into IoT for real-time asset tracking (Atzori et al., 2022), AI for demand anticipation and inventory management (Chopra & Meindl, 2021), and ERP for process automation and data integration (Kumar et al., 2023), all while working within its limited budget. Even Telecel, with its financial constraints, can benefit from cost-efficient tech like IoT for infrastructure tracking (Lee & Lee, 2022), AI for demand prediction

and inventory optimization, and ERP for process streamlining (Davenport & Dyché, 2022), enabling smarter decision-making and efficiency gains.

4.6 Performance metrics currently used to measure supply chain performance



4.6 Figure 6: Performance metrics currently used to measure supply chain performance

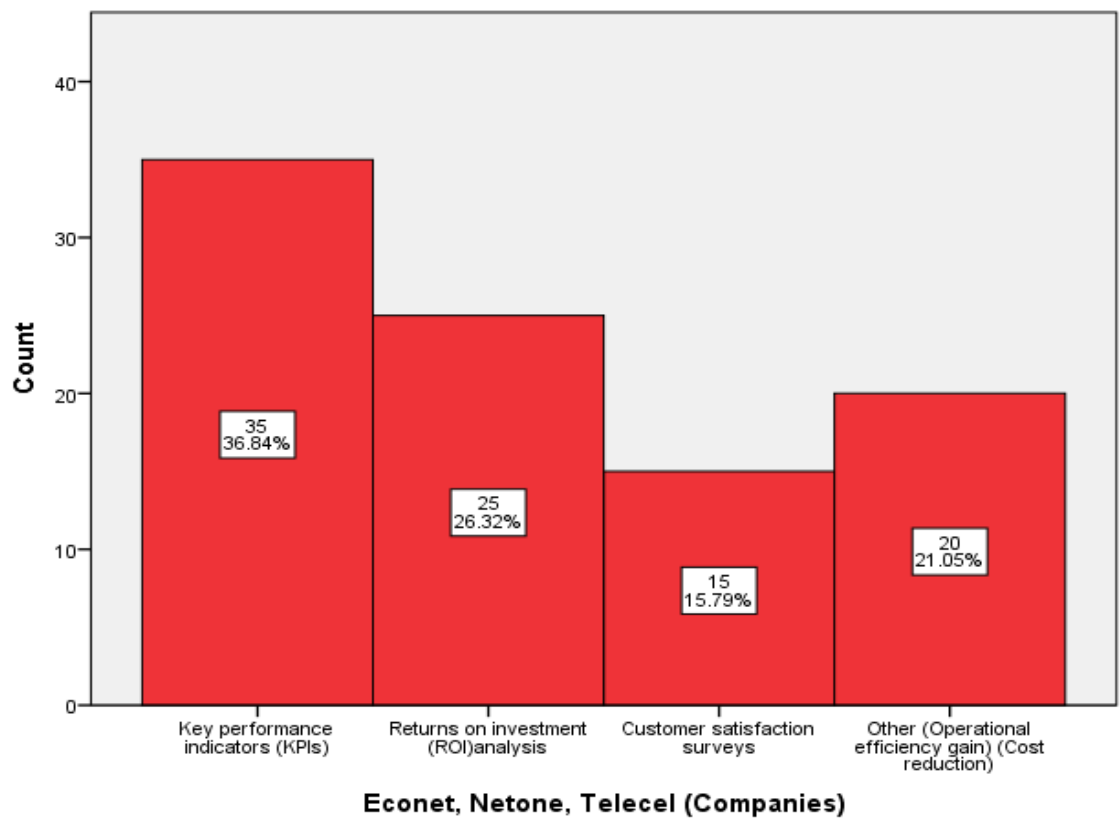
Source: Primary data, 2025

The above figure 4.6 is illustrating the performance metrics currently used to measure supply chain performance by Econet, NetOne and Telecel. NetOne and Telecel with 22.22% responses uses lead time to measure their supply chains. More so, Inventory turnover with 22.22% of responses is used by NetOne and Telecel as performance metrics to measure the supply chain performance. Econet also uses supply chain visibility as responded by 16.67% of targeted employees of the company to measure supply chain performance. NetOne also use customer satisfaction as a performance metrics currently to measure their supply chain performance with 11.11% responses as shown above. Digital adoption rate is also another performance metrics currently used to

measure supply chain performance by Econet as shown above 16.67% of responses outcome. In addition, Telecel also mentioned another performance metrics they currently use other than the ones I had listed on the questionnaire which is budget utilization with 11.11% responses as other, to measure supply chain performance.

In Zimbabwe each telecom company has its unique approach to measuring supply chain performance shaped by its financial situation and priorities. Econet the industry leader, leverages advanced metrics like digital adoption rate and supply chain visibility to maintain its competitive edge (Kshetri, 2020). In contrast, NetOne focuses on practical metrics such as lead time, inventory turnover, and customer satisfaction to drive efficiency within its limited budget (Chopra & Meindl, 2021). Meanwhile Telecel despite its financial challenges, prioritizes basic metrics like lead time, inventory turnover, and budget utilization to ensure operational efficiency and identify areas for improvement (Porter & Heppelmann, 2020). By embracing these metrics, each company can optimize its supply chain operations and stay competitive in the market.

4.6.1 How do you think digital supply chain initiatives could be measured effectively?



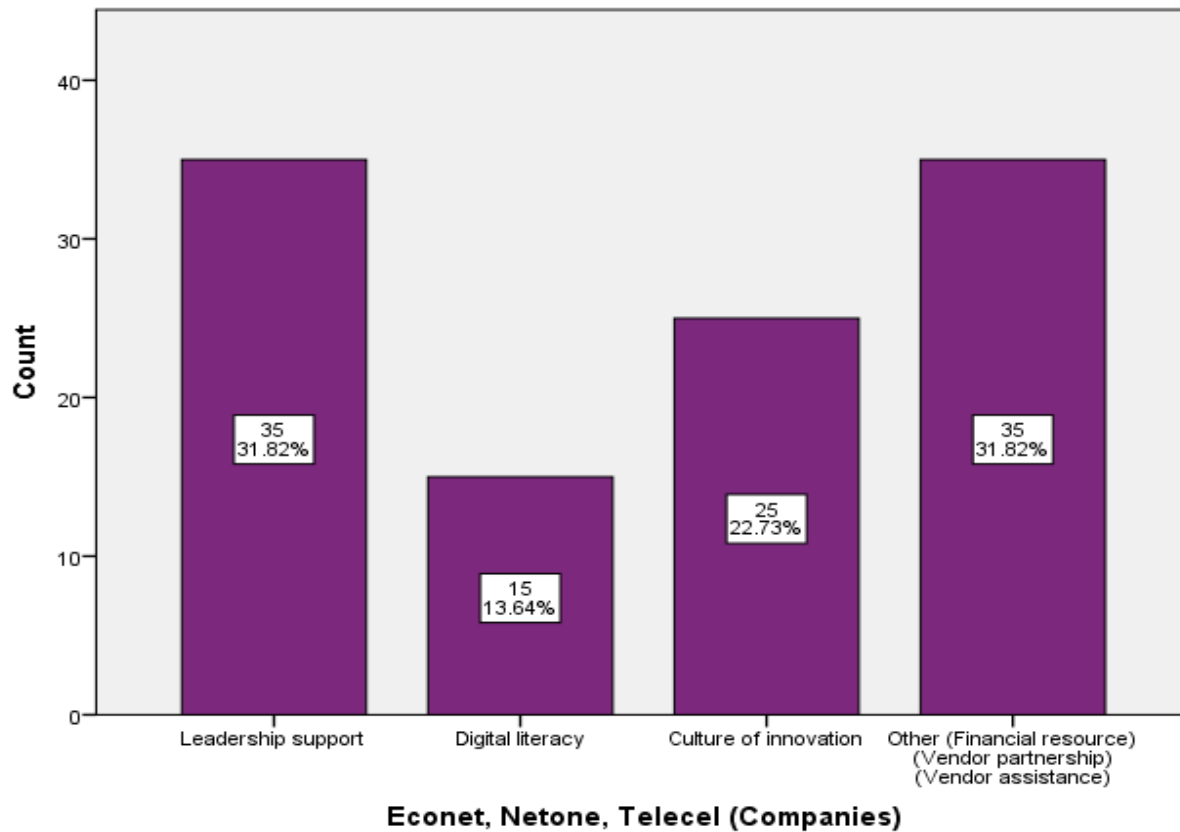
4.7 Figure 7: How do you think digital supply chain initiatives could be measured effectively?

Source: Primary data, 2025

The figure 4.7 above indicates responses from a question on how Econet, NetOne and Telecel think digital supply chain initiatives could be measured effectively. 36.84% of both Econet, Telecel and Telecel targeted employees uses Key performance indicators (KPI) to measure effectively. Returns on investment (ROI) analysis with 36.32% responses is used by Econet and Telecel to measure their digital supply chain initiatives effectively. More so, Econet uses Customer satisfaction survey to measure their digital supply chain initiatives effectively with 15.79% of responses as shown above. NetOne and Telecel also indicated that they have other ways they use to measure the digital supply chain initiatives effectively represented by 21.05% responses on the graph. The other ways are operational efficiency gain used NetOne and Cost reduction used by Telecel.

Econet as the industry leader, employs comprehensive metrics such as advanced KPIs, ROI analysis, and customer surveys to refine its digital strategies (Gartner, 2022; Deloitte, 2023). NetOne, meanwhile, focuses on practical metrics like lead time and inventory accuracy to gauge the effectiveness of its digital initiatives (McKinsey, 2023). Telecel, despite financial constraints, uses basic yet impactful metrics like service uptime and cost reduction to measure the success of its digital endeavors (Supply Chain Management Review, 2022). By adopting these measurement approaches, each company can optimize its digital supply chain initiatives and drive business growth.

4.7 Enabling factors



4.8 Figure 8: Enabling factors

Source: Primary data, 2025

Figure 4.8 above shows the enabling factors driving Econet, NetOne and Telecel's digital supply chain initiatives. Econet, NetOne and Telecel both use leadership support with 31.82% responses as enabling factors. More so, Econet uses digital literacy with 13.64% responses as an enabling factor driving its digital supply chain initiatives. Econet and NetOne use culture of innovation with 22.73% responses as an enabling factor that drives digital supply initiatives as illustrated on the chart above. There are also other enabling factors with 31.82% responses indicated on the chart above that are used by Econet, NetOne and Telecel as enabling factors that drive their digital supply chain initiatives. These enabling factors are, financial resources used by Econet, vendor partnership used by NetOne and vendor assistance used by Telecel.

The digital supply chain transformation landscape varies significantly across Econet, NetOne, and Telecel, driven by distinct enabling factors. Econet's strong leadership commitment, coupled with its high digital literacy and innovative culture, positions it as a frontrunner in leveraging digital technologies to enhance its supply chain operations (Gartner, 2022; Deloitte, 2023). NetOne, despite facing budget constraints, has made modest progress through strategic vendor partnerships and a focus on practical, cost-effective solutions (McKinsey, 2023). Meanwhile, Telecel's financial limitations and low digital literacy hinder its ability to drive large-scale transformation, although vendor support and small-scale initiatives have yielded some benefits (Supply Chain Management Review, 2022). Ultimately, each company's unique circumstances shape its approach to digital supply chain transformation.

4.8 Document analysis

Zimbabwe's telecommunications companies Econet Wireless, NetOne and Telecel are at different stages of supply chain digitalization with Econet leading through advanced technologies like AI and IoT while NetOne and Telecel face financial and operational challenges (Vial, 2021). Despite barriers such as inadequate funding, low digital expertise and weak infrastructure (Berger et al., 2020), technologies like IoT and ERP offer significant potential for improving efficiency and success can be measured through metrics like lead times, inventory turnover and digital adoption rates (Brennen and Kreiss, 2020; Trittin-Ulbrich et al., 2021).

4.9 Summary

In this section, the researcher summarizes the findings, provides a conclusion and offers recommendations based on the study's objectives and research questions. To wrap up the research, suggestions are also made for further exploration of topics that were beyond the scope of this study.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENTATIONS

5.1 Introduction

In this section, the author presents a summary, draws a conclusion and offers recommendations. To wrap up the research, suggestions are made for further exploration of topics that were not addressed in the study.

5.2 Summary of the findings

The research revealed that the three telecommunications companies Econet, NetOne and Telecel are all at a similar stage of digitalization classified as "Partially Digitalized." Despite making progress, significant barriers remain that include limited budgets, outdated infrastructure and varying levels of digital literacy among employees. The survey results indicated that while all companies face common challenges such as resistance to change and financial constraints, unique issues also emerged for each, highlighting the need for tailored strategies to enhance their digital supply chains.

Furthermore, the study identified key enabling factors driving digital transformation within these firms. Leadership support emerged as crucial, particularly for Econet which also benefits from a strong culture of innovation and higher digital literacy. In contrast, NetOne and Telecel are navigating their digital journeys through strategic vendor partnerships and small-scale initiatives. The findings suggest that by leveraging technologies like AI and IoT, these companies can significantly enhance their supply chain efficiency. The research emphasizes the importance of measuring digital initiatives through KPIs and ROI analysis to ensure continuous improvement and adaptation in a rapidly evolving industry.

5.3 Conclusions

5.3.1 Objective 1: To compare the current state of supply chain digitalization across Econet, NetOne and Telecel.

Based on the study's findings, the comparison of the current state of supply chain digitalization across Econet, NetOne and Telecel reveals that all three companies are classified as "Partially Digitalized." This indicates that while they have made strides in their digital transformation efforts, significant gaps remain. Each company is at a similar stage, suggesting a commonality in the challenges faced such as infrastructure limitations and financial constraints. These findings underscore the need for targeted strategies that can help accelerate their digitalization journeys and enhance overall operational efficiency.

5.3.2 Objective 2: To identify and evaluate the key challenges hindering digital supply chain implementation.

According to the study's findings, the identification and evaluation of key challenges hindering digital supply chain implementation highlight several critical factors affecting Econet, NetOne and Telecel. Budget limitations, infrastructure issues and resistance to change emerged as prominent obstacles. Notably, each company faces unique challenges that require tailored approaches to overcome. Addressing these barriers is essential for fostering a more robust digital supply chain, enabling these companies to leverage technology effectively and remain competitive in the telecommunications sector.

5.3.3 Objective 3: To assess the potential of various digital technologies to transform the supply chains.

In addition, the study finds that assessing the potential of various digital technologies to transform supply chains reveals significant opportunities for improvement across all three companies. Technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), and Enterprise Resource Planning (ERP) were identified as having considerable transformative potential. Despite varying degrees of financial resources and readiness to adopt these technologies the findings indicate a strong commitment from each company to leverage these innovations to enhance supply chain efficiency and responsiveness.

5.3.4 Objective 4: To develop a framework of performance metrics to measure the impact of digitalization initiatives.

The research findings conclude that the development of a framework of performance metrics to measure the impact of digitalization initiatives has provided valuable insights into how Econet, NetOne and Telecel can effectively track their progress. Metrics such as Key Performance Indicators (KPIs), Return on Investment (ROI) analysis and customer satisfaction surveys emerged as essential tools for evaluating the success of digital initiatives. Implementing these metrics will enable the companies to refine their strategies, drive continuous improvement and ultimately achieve their digital transformation goals.

5.4 Recommendations

- It is recommended that, to address the skills gap identified within the workforce particularly at Telecel, it is essential for all three companies Econet, NetOne and Telecel to invest in comprehensive training and development programs. By prioritizing digital literacy initiatives, these companies can empower their employees to effectively utilize new technologies. This training should focus on emerging tools such as AI and IoT, enabling staff to adapt to evolving digital landscapes. Continuous learning opportunities will not only enhance individual capabilities but also foster a culture of innovation which is vital for successful digital transformation across the organizations.
- The research findings highlighted that, limited budgets and outdated infrastructure are significant barriers to digital supply chain implementation particularly for NetOne and Telecel. Therefore, a strategic approach to investing in infrastructure is crucial. Companies should explore partnerships with technology vendors to share costs and resources thus, ensuring that they can upgrade their systems without straining their financial capabilities. Investing in scalable and flexible infrastructure will not only support current digital initiatives but also prepare the companies for future advancements in technology hence, facilitating smoother transitions as digitalization progresses.
- In addition, for Econet, NetOne and Telecel companies to accelerate their digital transformation journeys, they should foster collaboration among themselves and with

external stakeholders. By establishing a platform for knowledge sharing and best practices, these companies can learn from one another's successes and challenges. Collaborative projects can also lead to innovative solutions that address common issues in digital supply chain management. This approach would enhance collective capabilities and drive faster adoption of digital technologies thus, ultimately benefiting the entire telecommunications sector in Zimbabwe.

5.5 Suggestions for further research

- The study recommends that, future research should focus on the impacts of emerging technologies like blockchain and machine learning on supply chain operations in the telecommunications sector. Examining their potential to improve efficiency and customer satisfaction would yield valuable insights. Additionally, investigating the influence of organizational culture and employee engagement on digital transformation could highlight key success factors. On the other hand, expanding the study to other industries would help identify common challenges and best practices hence, leading to more effective digitalization strategies across various sectors.

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INFORMED CONSENT



Dear Participants

Request for participation on student's questionnaire

My name is Rufaro Manguwo a student at Bindura University. As part of my academic research, I am conducting a study on Transforming Supply Chains through digitalization. I am reaching out to you to kindly request your participation by completing a questionnaire related to this topic. Your responses will be treated with the utmost confidentiality and will only be used for research purposes.

Participation in this questionnaire is voluntary and you have the right to withdraw at any time. Your decision to participate or not will not have any impact on your relationship with Econet Wireless, NetOne and Telecel or any associated entities. The questionnaire will take approximately 8-12 minutes to complete. It is recommended to complete the questionnaire in one sitting to ensure the accuracy and completeness of your responses. If you have any questions or concerns regarding the questionnaire or the research study, please feel free to contact me on 0713841354. I am more than willing to provide any clarification or assistance you may require.

Once again, I extend my sincere gratitude for considering participation in this research.

Thank you for your time and support

Yours sincerely

Rufaro Manguwo

QUESTIONNAIRE

DATA COLLECTION TOOL

My name is Rufaro Manguwo an undergraduate student at Bindura University of Science Education doing a Bachelor's Honours Degree in Purchasing and Supply. In fulfillment of the programme requirements and objectives, I am conducting research on **Transforming Supply Chains through Digitalization: An analysis of key elements, challenges, enablers and performance metrics. A Case Study in Telecommunication companies (Econet Wireless, NetOne and Telecel Zimbabwe)**. I am requesting you to assist me by answering all the questions in this questionnaire from your organization's point of view selecting the most appropriate answer (s). All the responses will be treated with utmost confidence as the results will be used for academic purpose only and no attempt will be made to identify any individual organization in any public. Your valuable input will be important for the success of the study and will be greatly appreciated

INSTRUCTIONS

1. Please do not provide your name.
2. Please indicate your answer and tick the appropriate circle where applicable.
3. There is no right or wrong, good or bad answers. Only your honest or valuable opinions matters
4. If the question is not applicable to you, please indicate [N/A]
5. Your responsiveness in answering the questionnaire indicates your willingness to participate in the survey.

SECTION A

Demographics

1. What is your gender?
 - ☐ Male
 - ☐ Female
2. What is your age group?
 - ☐ Below 30
 - ☐ 30-40

- 41-50
- 51 and Above

3. Which company do you work for?

- Econet
- NetOne
- Telecel

4. What is your department in the company?

- Supply Chain
- Digital Technologies

5. What are your academic qualifications?

- A' level and O' level
- College diploma
- Undergraduate
- Post graduate

6. What is your role/position in the company?

- Supply Chain Manager
- Digital Transformation Specialist
- Logistics Coordinator
- Procurement Specialist
- IT Managers
- Software Developers
- Data Analysts
- Inventory Managers
- Other (please specify)

7. How long have your organization been around operating in the industry?

- 2 years and below
- 3-5 years
- 6-9 years
- 10 years and above

8. How long have you been employed by the company?

- Less than 3 years
- 3-5 years

- 6-8 years
- Above 8 years

9. What is your experience in supply chain management/digital technologies?

- Less than 2 years
- 2-5 years
- 5-10 years
- More than 10 years

SECTION B

Current Level of Digitalization

1. How would you describe the current state of supply chain in your organization?

- Manually operating
- Partially digitalized
- Fully digitalized
- Optimized and automated

2. What digital technologies are currently used in your supply chain? *Select all that apply*

- ERP (Enterprise Resource Planning)
- Blockchain
- IoT (Internet of Things)
- AI (Artificial Intelligence)
- Other (please specify)

3. How would you rate the current level of digitalization in your supply chain?

- Very Low
- Low
- Average
- High
- Very high

4. How does your company's digitalization level compare to industry peers?

- Ahead of peers
- On par with peers

- Behind peers
- Unsure

SECTION C

Challenges in Digitalizing Supply Chains

1. What are the biggest challenges you face in digitalizing your supply chain?

- Limited budgets
- Lack of digital literacy
- Resistance to change
- Infrastructure
- Cost
- Other

2. How do you currently address these challenges? *Select all that apply*

- Budget allocation
- Partnering with technology vendors
- Training and development
- External expertise
- Conducting cost-benefit analysis
- Other

3. Are there any specific pain points or areas where digitalization could improve your supply chain?

- Inventory management
- Supply chain visibility
- Demand forecasting
- Logistics and transportation
- Other (please specify)

SECTION D

Digital Technologies for Transformation

1. Which digital technologies do you believe offer the greatest potential for transforming your supply chain?

- AI (Artificial Intelligence)
- Blockchain
- IoT (Internet of Things)
- ERP (Enterprise Resource Planning)
- Other (please specify)

2. How do you envision these technologies improving your supply chain operations?

- Enhanced supply chain visibility
- Improved demand forecasting
- Increased efficiency and productivity
- Better decision-making
- Other (please specify)

3. Are there any specific use cases or applications you're exploring?

- Predictive maintenance
- Real-time tracking and monitoring
- Automated inventory management
- Other (please specify)

SECTION E

Performance Metrics

1. What performance metrics do you currently use to measure supply chain performance?

- Lead time
- Inventory turnover
- Supply chain visibility
- Customer satisfaction
- Digital adoption rate
- Other (please specify)

2. How do you think digital supply chain initiatives could be measured effectively?

- Through key performance indicators (KPIs)

- Through return on investment (ROI) analysis
- Through customer satisfaction surveys
- Other (please specify)

3. Would you be open to developing a robust set of performance metrics to evaluate digital supply chain initiatives?

- Yes
- No
- Maybe

4. Measuring digital maturity: (i)We regularly assess our digital maturity in supply chain management.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

5. How do you prioritizing digital initiatives?

- Based on business value
- Based on customer needs
- Based on technological feasibility
- Other (please specify)

SECTION F

Enablers for Digital Supply Chain

Transformation

1. What are your enabling factors?

- Leadership support
- Digital literacy
- Culture of innovation
- Other (please specify)

2. Fostering a culture of innovation: (i)Our leadership supports digital transformation initiatives.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

3. How do you view the role of digital literacy?

- Critical
- Important
- Nice to have
- Not important

SECTION G

Experts Insights

1. What advice would you give to companies looking to digitalize their supply chains?

2. What are the most significant benefits you have seen from digitalizing supply chains?