DIGITAL TRANSFORMATION IN SMALL AND MEDIUM-SIZED TEXTILE ENTERPRISES (SMTES) IN LAGOS, NIGERIA: ASSESSING THE ADOPTION OF E-COMMERCE AND ENTERPRISE RESOURCE PLANNING (ERP) FOR OPERATIONAL EFFICIENCY AND FINANCIAL PERFORMANCE

by

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DISSERTATION

Presented to the Swiss School of Business and Management Geneva

In Partial Fulfillment

Of the Requirements

For the Degree

DOCTOR OF BUSINESS ADMINISTRATION

SWISS SCHOOL OF BUSINESS AND MANAGEMENT GENEVA

May 2025

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Dedication

I dedicate this study to my lovely wife, Nneka, and children, Tega (Patrick), Ese (Ronald), and Daniel (Somtochukwu), and my late parents, Chief A.F.S Onojaefe, and Chief (Mrs.) Teresa Onojaefe, my late brother, Anthony Aduaye-Odiete. Moreso to all my siblings. I am so grateful to you all for your love, encouragement, and support.

Acknowledgments

To God almighty for HIS protection, grace, wisdom, strength, good health, and abundant blessings. This would not have been possible if not for God. All glory to God.

Meanwhile, my DBA program has been a journey and has been made possible by several people who have encouraged and supported me through this journey.

To my mentor and supervisor, Dr. Anna Provodnikova, with in-depth knowledge, experience, and fantastic academic and business professionalism, a huge thank you for your encouragement, painstaking guidance, reviews, feedback, and comments provided throughout my entire DBA journey, from the research proposal to the writing of the thesis. These have been invaluable. I am grateful in every way, and I sincerely desire to continue our collaborations even into the future.

Many thanks also to the committee members, the Dean of SSBM (Dr. Mia Simcox), and the entire team/staff of the University for their encouragement and way of ensuring that all academic resources, instructions including webinars needed for the program(s) are made available.

Thanks also to all who have in one way or another contributed and helped during this journey, Dr. Ken Ip (my earlier mentor) Dr. Fidelis Amahi, and Mathew Mcdonnell of Willis Towers) for your comments and suggestions during the questionnaire stage, the two field workers (Priscilla Odoh and Victor Odoh) who physically transversed the SMTEs in Lagos for many hours helping with the field data collection data for the study. Your help has been invaluable towards the completion of my thesis.

To my dear friends and colleagues at Afreximbank, Ekene Vitalis Uzor, Dr. Enga Kameni, Humphrey Nwugo, Ody Akhanoba, Dr. Abel Osuji for their encouragement all through and my teammates at the Bank (Amgad El-Morsy and Joseph Iyadi) for their dedication to duty and professionalism.

To my lovely family, wife, and children, thanks a lot for your understanding, and encouragement and for allowing me the space and time to dig into the program and ensure completion.

My gratitude also to my late parents (Chief and Chief (Mrs.) A.F.S. Onojaefe) and my nuclear Aduaye-Odiete family, for your belief in me and encouragement to always strive for higher goals.

Everyone has not just made my DBA journey enjoyable from start to finish but worthwhile in every way, I learned a lot and am now better and more knowledgeable than I was at the start. May God bless you all.

ABSTRACT

DIGITAL TRANSFORMATION IN LAGOS SMALL AND MEDIUM-SIZED TEXTILE ENTERPRISES (SMTES): E-COMMERCE AND ENTERPRISE RESOURCE PLANNING (ERP) ADOPTION FOR EFFICIENCY AND FINANCIAL PERFORMANCE

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May 2025

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In the contemporary business landscape, digital transformation has emerged as a critical factor, particularly for small and medium-sized textile enterprises (SMTEs) as they endeavor to harness the potential of digital technologies (e-commerce, ERP systems). Using the theories of Technology-Organization-Environment (TOE) and Resource-Based-View (RBV) as a framework, this study set out to investigate how widespread the use of digital technology is among small and medium-sized enterprises (SMEs) in Lagos, Nigeria, and how this affects their operational efficiencies and financial performance.

The researchers used a mixed-methods approach for the study combining both quantitative and qualitative approaches to acquire a comprehensive dataset from SMTEs situated in Lagos, the most extensive City in terms of both size and population in Nigeria. The target population comprised 600 SMTEs in Lagos, out of which 400 responses were received. The SPSS program was used to examine the collected data.

Findings reveal that the adoption rate of digital technologies among SMTEs in Lagos is relatively low at 46.5%. However, enterprises leveraging e-commerce and ERP systems reported significant improvements in sales, market size, and customer satisfaction. Correlation and regression analyses confirmed a positive relationship between digital technology adoption and sales growth, while chi-square tests highlighted the role of e-commerce in market expansion. The Improved customer engagement and satisfaction were attributed to progress customer relationship management and online shopping experiences facilitated by these technologies. Additionally, key performance indicators such as "Gross profit margin, return on sales (ROS), and Return on assets (ROA)" showed a positive correlation with the adoption of digital technologies, underscoring their role in driving sustainable financial performance.

A new corpus of literature will be added to by the study's findings on digital transformation, as positive social change by driving digital transformation by the SMTEs through the implementation of digital technologies and its subsequent impact on their operational efficiencies and financial performance in Lagos and generally within the SMTEs sector in Nigeria. In addition, the research outcomes are anticipated to make significant contributions to informing policymakers and industry stakeholders on some of the potential benefits and challenges associated with the acceptance and application of digital technologies.

Keywords: Digital Transformation, Small and Medium-Sized Textile Enterprises (SMTSs), Digital Technologies, Adoption, Implementation, Sustainable Financial Growth, Mixed-Methods Research, Nigeria.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

Abbreviations	Full Form
SMTEs	Small and Medium-Sized Textile Enterprises
CSC	Clothing Supply Chain Concepts
TOE	Technology-Organization-Environment
RBV	Resource-Based-View
SDL	Service-Dominant-Logic
TCT	Transaction-Cost-Theory
AI	Artificial Intelligence
ERP	Enterprise Resource Planning
CI	Continuous Improvement
EMS	Environmental Management Systems
CFA	Confirmatory Factor Analysis
SPSS	Statistical Package For The Social Sciences
KPIs	Key Performance Indicators

CHAPTER I:

INTRODUCTION

1.1 Introduction

Nigerian small and medium enterprises (SMEs) are a vital sector of the economy, comprising 97% of businesses and contributing 46.5% to the GDP in nominal terms (Ebitu, Basil, and Ufot, 2016). Textile enterprises, nested within the SME category, play a fundamental role in this contribution. The history of the Nigerian textile industry is rich, with a long tradition of textile production. The Nigerian domestic textile industry, which in the years leading up to the 2000s was a huge revenue earner for the government, is the second-largest employer of labour, after the government, and accounts for about 25% of manufacturing GDP and over 20% of corporation tax income (Owen et al., 2016b). While in Nigeria, textile production is regionally specific and culturally significant, including spinning, weaving, dyeing, printing, and garment manufacturing.

However, in the years leading up to 2020, the textile manufacturing sector experienced a severe setback with over 70 companies ceasing operations and laying off more than 250,000 direct and indirect workers (Manufacturers Association of Nigeria, 2019). This closure was attributed to a combination of internal and external factors, including slow adoption of technological innovations, regulatory issues about product quality, limited raw material supply, a shrinking customer base due to imported superior products, executive management, changes in a competitive landscape, obsolete machinery and equipment, and deteriorating social and physical infrastructures (Muhammad et al., 2018).

Despite substantial financial interventions such as the injection of N500 billion by the federal government of Nigeria into the textile sector, over 120 textile companies also succumbed (Anudu, 2022). The demise of these textile companies was credited to

encounters such as smuggling, dumping, restricted financial opportunities, power-related issues, and the broader context of deindustrialization (Renne, 2020). This underscores the complex and multifaceted nature of the obstacles faced by SMEs textile outfits, even in the face of substantial external financial interventions.

Nonetheless, the textile industry in Nigeria holds substantial and great export potential, more so particularly due to its contemporary designs and traditional textiles. In the apparel markets, the projected value for 2023 stands at USD 8.61 billion, with expected growth of 7.75% (CAGR 2023-2027) and an anticipated job creation of 2 million jobs (Famuyi, 2019). Consequently, the industry in Lagos Nigeria can help contribute to employment generation, stimulate economic growth, and promote Nigeria's cultural heritage.

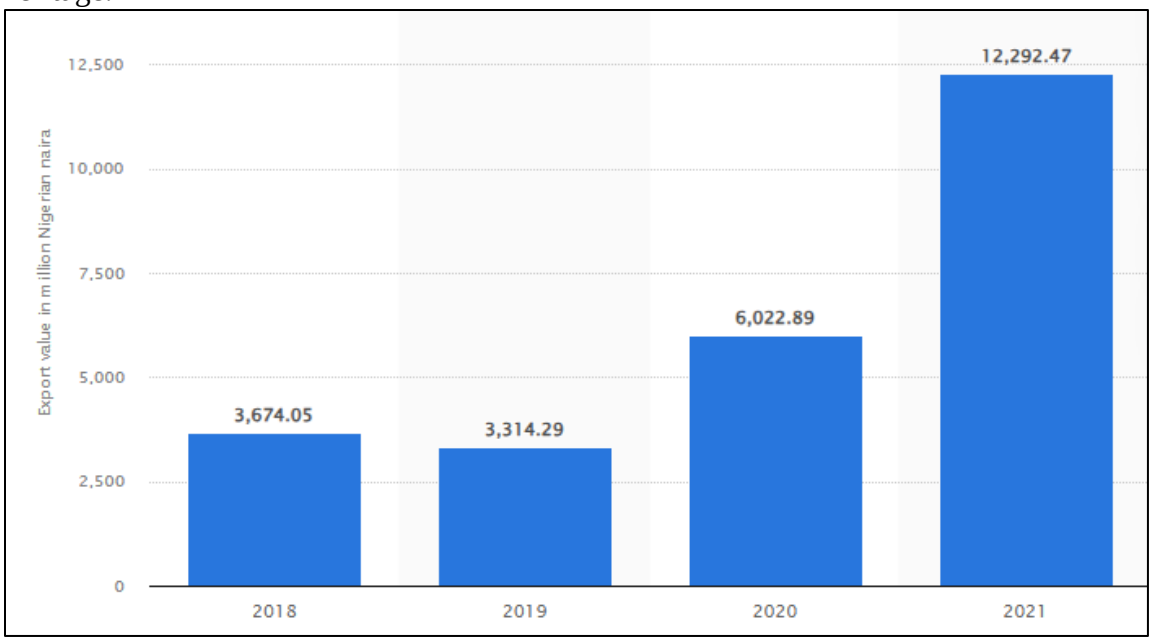

Figure 1.1: The textiles and textile articles exported from Nigeria from 2018 – 2021 (in million Nigerian Naira) (Source: Doris Dokua Sasu, Jan 24, 2023)

The data presented above illustrates that in 2021, Nigeria recorded textile and textile products exports amounting to N12.3 billion, equivalent to USD29.6 billion. This marks a substantial increase from the N3.7 billion, approximately USD8.9 million reported

in 2018 (Sasu, 2023). Amidst the acknowledged challenges, both external and internal (Yusuf, Salihu, and Danladi, 2021), a pivotal concern emerges – how to stimulate practical innovations like digitalization or digital transformation. Such innovations have the potential to be more well-organized and operative (Farsi et al., 2014), offering a pathway to address some of the identified challenges and foster sustainable financial growth for SMTEs. While Eller et al. (2020b) emphasized the pivotal role of digital technologies as a significant concern for SME managers, Morgan-Thomas (2016, p.1122) underscored that digitalization is a prerequisite for achieving digital transformation (Verhoef et al., 2019). Further, Lukonga (2020) represented the potential of digital technologies to enhance SMEs' productivity and stimulate growth.

There is therefore a growing drive for sustainability and innovation within the textile sector including the technology use to improve their production competence and quality of outputs.

Consequently, it becomes important for SMEs in the textile sector to embrace and implement digital technologies to improve their competitiveness and gain tangible benefits, such as enhanced operating efficiencies and financial performance.

In an increasingly digitalized world, e-commerce and ERP technology systems present promising solutions to the challenges besetting SMTEs. E-commerce platforms can open new and global markets and streamline their sales processes, while ERP systems can help in operational efficiencies and resource-based management.

However, while most of the existing research proposes that digitalization has a positive influence on businesses, partial implementation of reforms also explains some of the underperformance of the SMTEs in addition to frictions in strategy design (Lukonga, 2020).

1.2 Research Problem

Small and medium-sized textile enterprises (SMTEs) in Lagos Nigeria grapple with numerous challenges hindering their pursuits of operating efficiencies and financial performance. Challenges include resource constraints, financial limitations, inadequate infrastructures, entrepreneurial and technical skills shortages, management expertise, operational inefficiencies, and company aversion to transformation. Despite these issues and the recognized potential benefits of digital transformation, this research endeavors to assess the degree of adoption and application of digital technologies, specifically e-commerce, and ERP systems, within these enterprises, with a primary focus on understanding the impact on the SMTEs' operational efficiencies and financial performance.

1.3 Purpose of Research

The purpose of this research is to discover the acceptance of e-commerce and ERP systems of SMTEs in Lagos Nigeria and how these can advance the operational efficiency and financial performance of these textile enterprises.

The researcher, therefore, seeks to examine the aspects that affect the embracing of digital technologies and problems faced by SMTEs and, where implemented, understand the consequences of these technological tools on SMTEs' operating efficiencies and financial performance. In addition to providing some clarity, the researcher will recommend actions that stakeholders can take, including SMTE owners, policymakers, and industry professionals, to enhance the rate of adoption of digital technology tools among SMTEs. More specifically, the study focused on the following objectives:

1. To appraise the current level of adoption of e-commerce and ERP systems among SMTEs in Lagos, Nigeria
2. To determine and examine the drivers and limitations affecting the adoption of e-

commerce and ERP systems amongst SMTEs in Lagos, Nigeria

3. To appraise the impact of e-commerce and ERP systems on operational efficiency and financial outcomes in SMTEs in Lagos, Nigeria
4. To determine the major challenges observed during the implementation of e-commerce and ERP systems and propose workable solutions to mitigate these challenges.

To fulfil these objectives, the following hypotheses are tested in this research work:

Hypothesis 1: -

- **Null Hypothesis -** A significant proportion of SMTEs in Lagos Nigeria have not fully adopted e-commerce and ERP systems.
- **Alternate Hypothesis -** A significant propoertion of SMTEs in Lagos Nigeria have fully adopted e-commerce and ERP systems.

Hypothesis 2: -

- **Null Hypothesis -** The implementation of e-commerce and ERP systems does not positively impact the operational efficiency and financial performance of SMTEs in Lagos Nigeria.
- **Alternate Hypothesis -** The implementation of e-commerce and ERP systems positively impacts the operational efficiency and financial performance of SMTEs in Lagos Nigeria.

1.4 Significance of Study

The findings of the research will provide practical suggestions for SMTE owners on the fundamentals for overcoming identified challenges and limitations in addition to leveraging the technologies, especially e-commerce and ERP systems, for improved business performance leading to operational efficiencies and financial performance.

It will also provide a basis for policymakers to promote an enabling environment for SMTEs and, consequently, adequate policies that would help in addressing the infrastructure gaps and skill gaps by offering educational programs and financial support to facilitate the application of digital technologies.

The study will also support the broader goal of economic development of Lagos Nigeria by the SMTEs leveraging the capabilities and enhancement of digital technologies, consequently resulting in employment generation, improved business, and operational efficiency, so promoting sustainable financial growth and competitive advantage.

The study will also contribute to the body of knowledge in the textile sector by providing empirical evidence on the level of adoption including the impact of e-commerce and ERP systems, in addition to confirming and extending the theories for this study (TOE, RBV) in a new context.

1.5 Research Purpose and Questions

The research questions are as follows;

1. To what extent have SMTEs in Lagos Nigeria adopted e-commerce and ERP systems?
2. What are the key factors influencing the adoption of e-commerce and ERP systems by SMTEs in Lagos Nigeria?
3. How does the implementation of e-commerce and ERP systems impact the operational efficiency and financial performance of SMTEs in Lagos Nigeria?
4. What challenges are faced by SMTEs in Lagos Nigeria in implementing e-commerce and ERP systems and how can these challenges be mitigated?

CHAPTER II:

REVIEW OF LITERATURE

2.1 Introduction

This literature review is an examination of the existing body of literature and industry practices related to digital transformation in SMTE, emphasizing on the current level of adoption and implementation of digital technologies of SMTEs in Lagos Nigeria and their impacts on the SMTEs operational efficiencies and financial performance.

The textile industry holds substantial importance in the Nigerian economy, contributing meaningly to employment and overall economic growth. Nevertheless, research suggests growing trends of SMTEs embracing e-commerce and ERP systems, though still grapple with challenges such as online payment, logistics, trust issues, and security (Nwosu, 2017a).

So, the textile sector in Lagos, as in Nigeria, grapples with various challenges, including limited access to capital, deficiencies in power infrastructure, and operational inefficiencies. Shettima and Sharma (2020) underscore the potential for growth in SMEs but note issues such as a lack of digital strategy training, limited utilization of digital technology or business purposes, and insufficient cybersecurity intelligence.

In addition, other challenges that the sector grapples with include infrastructural limitations, skill gaps, and organizational resistance to change. In elucidating barriers affecting the digital technologies implementation in the textile and clothing supply chain concepts (CSC), Pal and Jayarathne (2022) point out issues like issues with economic feasibility, strategic development, limited access to technology, and an absence of digital competence.

Despite these challenges, digitalization has emerged as a potential solution in recent years. However, while digitalization remains a relatively unexplored topic, the acceptance

of e-commerce and ERP systems have significant implications for SMTEs' competitiveness, global supply chains, efficiency, and integration. Hence, this research aims to inspect the result of digitalization on the operating efficiencies and financial performance of SMTEs in Lagos Nigeria.

As highlighted by Jones, Morrish, Deacon, and Miles (2018) influential owners in a firm responsible for decision-making are likely to approve expertise when they observe clear benefits from digitizing. Derchi (2022) characterizes digital transformation as disruption, asserting that the ongoing creative devastation is defining a new age and economic transformation. Derchi further emphasizes the necessity for organizations to adapt to this disruption by revolutionizing for the future and bringing transformation toward the unidentified. Although the literature has examined the reasons that lead to the adoption of e-commerce, the effects of this trend on revenue and profitability have received less attention (Zhu et al., 2021).

While SMEs are behind larger businesses when it comes to digitization, Eller et al. (2020), and this hurts firms' performance, the understanding is that SMEs have certain advantages which the larger firms do not have, and that is their small size, which gives them the flexibility to easily innovate including their coherent culture (Shepherd & Majchrzak, 2022).

So, the evolution of concepts such as customer satisfaction, advertising, and payments resulted from the fundamental involvement of technologies in today's businesses (PWC, 2020). A good example is businesses in Turkey wherein 41.2% of 131 SME businesses that underwent technological innovations for instance led to their operational efficiency of 96.9% (pwc, 2021).

Meanwhile, it is understood from a case study that the textile SME integrates EMS with lean manufacturing principles to reduce waste and improve financial performance.

The implementation focuses on identifying and eliminating non-value-added activities, optimizing material usage, and implementing waste reduction strategies. The study highlights the positive impact of EMS implementation on cost savings and environmental performance (Alkhoraif, Rashid, and McLaughlin, 2019).

So, while research suggests that there is a growing trend of SMTEs embracing e-commerce and ERP systems (a tool for streamlining business processes and for effective decision-making and data visibility) they still grapple with challenges such as online payment, logistics, and trust issues including security (Nwosu, 2017a). So despite growing recognition of the benefits of ERP systems for instance by the SMTEs in optimizing their processes and operations, inventory management, and customer satisfaction, ERP adoption is still relatively low due to the lack of awareness, high cost of implementation and resilience to change (Abuzawayda, 2022), while for e-commerce adoption is the result of digital literacy, internet penetration, and government and regulatory environment.

The implementation level of e-commerce in different countries in Africa, Asia, Middle East could be said to be low (Ahmad et al. 2020; Mohammed et al. 2013). Meanwhile in their work highlighted that, influential owners in a firm responsible for decision-making are expected to approve technology when they notice advantages from digitizing (Simmons et al., 2008).

2.2 Theoretical Framework

The relevant theoretical theories used for this research that can provide robust theoretical foundations on digital transformation of SMTEs, in Lagos Nigeria is the "Technology-Organization-Environment (TOE)" and "Resource-Based-View (RBV)". Several other theoretical foundations for digital transformation include the Diffusion-of-Innovation (DOI), the Service-Dominant-Logic (SDL) and the Transaction-Cost-Theory (TCT) theory and also bear some relevance.

The incorporation of these theoretical frameworks is crucial for establishing a foundation to understand the intricate relationship between digital transformation, digital technologies especially e-commerce and ERP systems and the operational efficiencies and financial performance of the SMTEs in Lagos Nigeria (Amade, Ogbonna and Nkeleme, 2022).

Consequently, the below details of these theoretical frameworks:

2.2.1 Technology-Organization-Environment (TOE)

This framework developed in 1990 provides for understanding the adoption of technological tools by organizations. The study examines how technology, organization, and environment affect the e-commerce implementation and ERP systems by SMTEs, in that the theory posits that technological, organizational and environmental contexts influence technology adoption, therefore considering the integration between technological factors, external environmental factors such as market competition, industry regulations, technological infrastructure such as the technology characteristics itself with the intricacy, compatibility of the prevailing systems and comparative benefit over substitute resolutions that shapes the background within which organizations operate, and organizational characteristics that is characterized by examining the internal aspects such as the culture, resources, capabilities and resources influencing the acceptance and application of technological resources such as e-commerce and of ERP systems and as espoused in the study in the Nigerian manufacturing sector by Amade, Ogbonna and Nkeleme (2022) and (Abuzawayda, 2022).

Following, that Industry 4.0 can help with such acceleration of industrial transition towards circularity Happonen and Ghoreishi (2022) and that ‘digital technologies help real-time material and products condition, availability, accessibility, and resources data, and boost the CE transition in textiles. Therefore, in utilizing the 4.0 technologies in the

industry, apparel industries, product design, development, prototyping, and recycling can be done with higher efficiency.'

Businesses are being internationalized across various industries and stakeholders, so transaction costs such as transportation, communication, coordination, payments, etc. of SMEs have been reduced due to the emergence and consolidation of ICTs (Shettima & Sharma, 2020). Various digital technologies have the ability to revolutionise the textile sector and positively affect CSC concepts pertaining to design, development of samples, sourcing, production, distribution, retail returns, and re-use procedures. In addition, is the various business intelligence tools that are now available which amongst others include Microsoft Excel, Power B1, and Tableau leverage, used to compare cashflows, time real-time statistical information, data necessary for strategy, and projections leading to increased profits. Apart from the use of various artificial Intelligence (AI), business intelligence tools, and available social media tools such as Facebook, Google, and Instagram, telegrams for digital markets, use of Zoom, Teams, etc. for virtual meetings and collaborations, great reach and human capital management, cloud computing, etc.

E-commerce for instance can provide small and medium-sized textile enterprises (SMTEs) with an online platform for procurement and vending their goods and services and consequently drive sales. The strategic methods for developing e-commerce will involve product strategy, customer relationships, and corporate considerations that must all work together. Consequently, the element of e-commerce therefore is about customer experience, back-end integration and digital marketing which ensures that the enterprise will connect and convert potential customers that visit the site, resulting in great benefits to the enterprise such as cost reduction as operating costs will be eliminated, can reach wider customer base, track logistics, eliminates delivery delay time, scalability. These are

despite the minor disadvantages of loss and lack of personal touch and the fact that customers might not be able to try a new product before buying.

Enterprise resource planning (ERP) system, be it either cloud ERP, on-premises ERP, or hybrid ERP, is another digital technology tool that (SMTEs) can deploy and implement for their business operations to enhance operating efficiencies. In order to maintain a healthy level, this system may automatically undertake financial analyses and forecast an enterprise's stock needs. In this way, we can be sure that things like on-demand products are always in stock and that the manufacturing department is running at full capacity. So, the solution manages the various resources and activities within the company to make sure that they are being utilized cost-effectively and efficiently, improves the accuracy rate of results, increases flexibility, and improves productivity such as higher management performance, standardized data, scalability, mobility, and cost savings despite the slight disadvantage of large costs of licensing, deployment and maintenance costs, training, and tweaking (Zadeh et al., 2018).

There has been recent discourse on the shift of industrial production from higher-income to lower-income countries, emphasizing the potential benefits of skill and technological transfer to the latter. A prominent example is China, which has witnessed a surge in outbound investments since it acceded to the WTO in the early millennium year of 2000. The proactive encouragement of firms to “Go Global” of Chinese government has played a pivotal role in this trend (Chen, Yunnan; Sun, Irene Yuan; Ukaejiofo & Xiaoyang, Tang; Brautigam, 2016). Notably, Chinese firms engaged in technical partnerships with Nigeria exemplify how the micro-level mechanism of technology transfer can contribute to broader processes of economic transformation. While instances of technology transfer between Nigerian and Chinese firms in light manufacturing and automobiles are limited, they hold significant importance. Encouraging government policies have further facilitated

Chinese investments in Nigeria, emphasizing the role of import substitution and technology transfer as integral components of Sino-Nigerian business partnerships.

2.2.2 Resource-Based View (RBV)

This theory argues that the strategic use of resources can lead to a sustainable competitive advantage (Barney, 1991). In the context of this study on the ways digital technologies might improve the operational and financial performance of SMTEs, it consequently alludes to the ways in which specialised resources and competencies, such sophisticated IT systems, can offer a competitive edge. So the theory espoused by Barney (1991) suggests that SMTEs should leverage their unique internal resources which include tangible and intangible assets such as "human capital, technological infrastructures, and organizational capabilities" to ensure effective and e-commerce acceptance and ERP systems to attain strategic objectives including operational excellence, customer service and innovation and sustainable competitive advantage, and which speaks to superior performance by leveraging their unique capabilities and resources in ways that are problematic to be imitated by competitors. The RBV has been applied to the study of digitalization and SMEs in various contexts by El-ebiary et al. (2022) in their studies which looked at the e-commerce adoption by SMEs in Nigeria, assessing its impacts on their enterprise productivity, in addition, to a study that explored the role of digitalization in enhancing the resources and capabilities of SMEs in the manufacturing sector (Akanbi & Akintunde, 2018). The finding therefore is that digitalization can enable SMEs to improve their production processes, customer relationships, and business models, thereby enhancing their competitive advantage. According to this theory, the adoption of digital technologies can augment the effectiveness of business operations, which can result in cost savings, improved quality, and increased productivity (Barney, 1991; Grant, 1991)

Consequently, if adopted SMTEs can achieve operational efficiencies and improved financial performance by leveraging digital technologies.

The researcher has also come to terms with the fact that digitalisation has a strong correlation with performance and mediates the impact of IT on performance, but it has no bearing on the impact of digital strategy or the proficiency of individual employees. So, for SMEs to continue to be the center of economic growth, SME digitization strategies are needed that put digitization at the center of their businesses, to become and remain competitive, enhance, and provide employment and be sustainable. An empirical study Hong et al. (2023) noted that technology can enhance market access, increase overall productivity, enhance operational efficiencies, and consequently promote economic growth.

Thus, digitalisation aids sustainability by intrinsically addressing sustainable development and circular economy principles (Philbin, Viswanathan, and Telukdarie, 2022), enables and fosters different product innovation and offerings including processes, the understanding of more dynamic business environment entry and scaling, facilitates productivity enhancing creative distribution (Calvino & Criscuolo, 2019), and deployment of certain tools, that could enhance operations such as artificial intelligence, business intelligence solutions (ERP), using intelligent machines to automate manufacturing and supply chains for instance, cloud computing that would enable SMEs to access business intelligence solutions without expending cashflows into hardware, software purchases in addition to using e-commerce channels for broader access base etc.

Hence digital technology serves as a fundamental tool to propel SMTEs towards augmented sales, expanded market size, heightened customer engagement and satisfaction, and sustainable financial growth. Enterprises deemed innovative, as defined by (Velthuijsen et al., 2018), are those that have actively pursued and implemented a product

or process innovation within the two years preceding the survey date, irrespective of the innovation's success. The adept utilization of information and communication technologies, encompassing digitalization and digital transformation, stands as a significant determinant for fostering successful innovation, competitiveness, and growth. Consequently, these factors represent substantial opportunities for SMTEs to fortify their market position and enhance their financial performance.

2.2.3 Diffusion of Innovations (DOI) Theory

The study was developed in 1962 by E.M Rogers and examines the complexities and perceived ease of use as critical factors influencing technology adoption (Sahin, 2006). Therefore, the theory identifies factors that influence the rate of adoption such as the relative benefit of an innovation over its predecessor indicates how much superior the new concept is considered. perceived complexity, which refers to how challenging it is to grasp, compatibility, which refers to how well an invention fits in with prior experiences, current values, and the requirements of possible adopters, using and implementing on the idea/innovation, trialability as to experimenting with innovation on a limited basis before making full commitment or purchase, and observability with regards to the degree to which the outcomes of invention are made manifest or visible to others. This bears relevance to the study as same theory was adopted in a research study that explored the aspects persuading e-commerce among SMEs in Lagos (García-Avilés, 2020).

2.2.4 The Service-Dominant-Logic (SDL)

This theory was developed by Parra-Sánchez and Talero-Sarmiento (2024). The theory speaks to co-creation through the integration of processes, such as service providers and customers, and in the background of e-commerce, an emphasis on the place of digital platforms in facilitating values of co-creation between the SMEs and their customers such as the exchange of goods and services. The SDL so espoused by Verhoef *et al.* (2021) is

another theory that speaks to the fact that values are co-created with the help of integrating resources or service providers and customers, and in the background of e-commerce, emphasizing the place of digital platforms in facilitating the value of co-creation between the SMEs and their customers such as the exchange of goods and services information exchange between parties, facilitating value co-creation and interaction in digital environments. Therefore, a need to understand customer needs, preferences, and experiences in designing and delivering value propositions consequently enhancing the role of digital technologies in upscaling customer engagement and satisfaction. (Mohammed et al., 2013), in their studies investigating the factors inducing the implementation of e-commerce by SMEs in Nairobi, Kenya, and, by extension, providing insights that are relevant to the Nigerian environment, applied the SDL theory to e-commerce adoption.

According to Yang et al. (2010), organizational management is therefore forced to incorporate policies and practices. Researchers looked at the effects of two advanced manufacturing processes, Supplier Management (SM) and Continuous Improvement (CI). SM encourages suppliers to work together more closely, while CI promotes a culture of innovation in both processes and products. By doing so, both processes help manufacturers gain the knowledge and skills needed to create an EM program that is proactive and, in the long run, makes them more competitive". Further, Lo, Yeung, and Cheng (2012) noted that the adoption of environmental management systems (EMS) is important and could have a significant effect on a firm's operational performance and so 'revealed that adoption of ISO 14000 improves manufacturer's 'profitability' in the FTIs over three years as measured by return-on-assets (ROA) mainly due to cost efficiency, measured by return on sales (ROS). So, the adoption of EMS improves the firms' financial performance'.

So, towards diversifying their revenue and income streams, executives are required to develop alternative business models with sustainable business development, noting that business innovation is the core of making a sustainable society (Schaltegger et al., 2011; Seebode et al., 2012) and by co-creation of value and sustainable initiatives (Gobble, 2013; Ramaswamy, 2009; Rodrigues et al., 2011). While social responsibility and sustainable development can be improved by consumer engagement Kozlowski, Searcy, and Bardecki (2016), co-creation allows the involvement of the customer in the process and permits for better access to their needs, behaviors and wants and consequently greater valued products creation.

These possibilities are further facilitated by the rise of social media, enabling consumers to exert a significant influence on product designs. Consumers actively engage in the design process, essentially becoming co-designers or producers. This dynamic shift alters the power dynamics in the association between consumers and fashion centers, impacting development and marketing strategies (Grose, 2012; Meroni & Fassi, 2013) A critical element in advancing sustainable supply chain development involves the establishment of codes, conducts, auditing, and capacity-building initiatives (Bhaduri & Ha-Brookshire, 2011). This is illustrated through transparent supply chain management, promoting accountability by involving stakeholders in scrutinizing the business practices of an apparel brand (Kozlowski et al., 2016). For the entire system to achieve sustainability, a holistic transformation is necessary. Failure to do so, even if the product is sustainable, may result in the underutilization of its full potential. Therefore, adopting a business model based on a systems approach, as emphasized by Meadows (2008), involves understanding the relationship between structure and behavior, offering insights into how the system operates, identifying factors leading to suboptimal results, and guiding interventions for improved behavioral patterns.

2.2.5 Transaction-cost-theory (TCT)

This theory was formally proposed in 1937 by Ronald Coase to explain the existence of firms. The theory deals with transactional costs (search, monitoring, negotiation, exchange) and the fact that firms choose a certain governing structure that minimizes transaction costs (Rindfleisch, 2020). Consequently, Economic efficiency is maximised by an optimal organisational structure that minimises the cost of transaction and so highlights the role of e-commerce and ERP systems in transaction cost reduction with information asymmetry, coordination, monitoring, efficiency as costs are reduced through an efficient selection of most appropriate governance structures.

The theory therefore has relevance to the role of e-commerce and ERP systems in transaction cost reduction associated with information asymmetry, coordination, monitoring, and efficiency as costs are minimized through an efficient selection of the most appropriate governance structures which include asset specificity, uncertainty and frequency of transaction, market exchanges, hierarchical control and relational contracting. This is exemplified by the recent studies by Nwosu (2017) that discover the aspects influencing implementation of ecommerce by SMEs in Nigeria assessing their perceived costs and benefits.

So, while the theoretical foundations provide for considerate the complex subtleties of digital transformation and as in the case of SMTEs in Lagos Nigeria, these theoretical frameworks were incorporated into the research study to provide a strong foundation and theoretical lenses through which to analyze and interpret the intricate relationship between digital transformation and SMTEs operating efficiencies and financial performance resulting from the e-commerce application.

Existing studies therefore affirm that digitalization has evolved into a pivotal catalyst for economic growth and competitiveness, with a growing body of literature delving into its influence on SMEs.

2.3 E-Commerce and ERP Systems

While measuring intangibles and non-financial measures poses a great challenge in the so-called knowledge economy, it is necessary for managers to develop suitable performance measures and metrics (Gunasekaran & Kobu, 2007) for their businesses, and while global economy featured global operations, outsourcing, supply chain and e-commerce, the right decision by Managers of SMTEs would improve the organizational competitiveness of the firms against the traditional performance measures.

Therefore, while the huge expenditures on Information Technology (IT) does not allow for better achievement by firms research covering 8 years (2008 – 2015) using data from the Spanish Survey on Business Strategies (ESEES) in the manufacturing sector (Lorca et al., 2019) of 2,544 companies, demonstrates that e-commerce appears to impact revenue growth, but neither business-to-consumers (B2C) nor business-to-business (B2B) transactions do. Sales made through physical channels and those made through e-commerce may, therefore, be subject to a substitution effect. The authors did find that businesses that implement extensive e-commerce strategies (both business-to-consumer and business-to-business at the same time) see a spike in their bottom line. If businesses limit themselves to business-to-business or business-to-consumer transactions, however, they won't see an uptick in profits until the year following the e-commerce status measurement.

The study used a mediated moderation model that was created and validated using information from 804 Chinese manufacturing companies. It also utilised two-stage least squares regression analysis to examine the connection between e-commerce, sales, and

capacity utilisation through the lens of process development and product focus, (Zhu et al., 2021) found that process innovation mediated the negative connection between e-commerce sales and capacity utilisation. Both the association between process innovation and capacity utilisation and the relationship between e-commerce sales and capacity utilisation are moderated by product focus. The researcher understands that there are firms that are now emerging in substantial numbers globally in the international business space. These are called the "born-global firms", often referred to as "international new ventures or global start-ups" and are early adopters of internationalization (Knight & Cavusgil, 2004), despite the limited human, financial, and material resources that are typical of startups, by utilising their inventiveness, expertise, and capacities, they are able to gain substantial access to international markets throughout their initial stages of development. In this age of globalisation and cutting-edge technology, they have reached adulthood. Knight and Cavusgil (2004). Further, internationalization has increased due to the emergence of mechanisms and infrastructure, accelerated by the emergence of more effective tools for doing business on a global scale.

Consequently, the changing nature of international trade is being ushered in by the internet and other forms of information technology, which are internationalising the rise of a borderless global economy. For the born-global, it implies entering into new or established goods and services and markets. A group of companies may need to adopt this innovative, visionary, and proactive stance in order to seize fresh opportunities in complicated industries that are often risky and uncertain, even while they have little resources to do so. In their pursuit of knowledge, born-global companies prioritise global technological competency, distinctive product creation, a focus on quality, and the utilisation of international distributor expertise. These "global technological leaders tend

to leverage information and communication technologies to interact more efficiently with channel members and customers, and to obtain various other benefits.

2.4 Adoption and Implementation Strategies of E-Commerce Technologies

This segment explores the factors influencing the adoption of e-commerce and ERP systems and so refers directly to the research objective of appraising the current level of adoption of e-commerce and ERP systems among SMTEs in Lagos Nigeria, consequently a direct resonance with the research purpose which is to explore the adoption of e-commerce and ERP systems, and how these advance the operational efficiency and financial performance of the textile enterprises.

Therefore, conceptually linked with the TOE (Technology-Organization-Environment) theory which posits that technology adoption is influenced by technological, organizational, and environmental context, and also to the RBV (resource-based-view) theory that speaks to how unique resources and capabilities such as advanced IT systems can provide competitive advantages and enhancing operational efficiencies and financial performance.

E-commerce involves the use of the internet and computer in carrying out business transactions, exchange of goods and services, including payment using electronic methods (Muhammad et al., 2017).

Meanwhile, neither B2B nor B2C e-commerce seems to influence revenue growth, therefore a substitution effect may exist between the sales by physical channels and e-commerce sales. Companies that adopt a high level of e-commerce (B2C and B2C simultaneously) immediately experience an increase in their profitability. However, Lorca et al. (2019) stated that if only B2B or B2C, the positive effects on profitability are achieved in the year after the measurement of the e-commerce status.

Meanwhile, to maintain a competitive edge in the long term, there is the need for SMEs to be innovative in their product offerings and deploy digital strategies (Matt et al., 2020), in addition to the opportunity for SMEs to leverage the capabilities of digital production methods to support a pathway towards sustainability (Denicolai et al., 2021).

Consequently, SMEs can develop their businesses (by digitalizing certain aspects of their businesses and adopting digital technology to change their value proposition, value creation, and value capture mechanisms (Priyono et al., 2020) and clearly defining the level and scope. The use of social media for example can also positively influence the financial performance of SMEs, by reducing marketing costs while improving customer relationships.

So due to advancements in technologies, new business strategies, models, management, and competition are evolving Taiwo (2016) and the social life of people (Xiang, Wang, Leary, & Fesenmaier, 2014) and by adopting e models of e-commerce such as Online marketplaces like Etsy, mobile apps for shopping, providing a convenient and accessible way for customers to browse and purchase products, Amazon, and eBay, SMTEs can leverage these platforms to reach a broader audience without the need for an individual e-commerce website or platform. Other models of e-commerce that SMTEs can adopt include;

- Social Media Commerce, SMTEs can sell directly on social media profiles, utilizing integrated shopping features to facilitate transactions. Examples of this include Instagram shopping and Facebook marketplace.
- Crowdfunding platforms, such as Kickstarter, and Indiegogo, where SMTEs can raise funds for their e-commerce venture by presenting their business idea to a community of backers.

- Drop shipping, such as Shopify, and WooCommerce, wherein SMTEs can adopt a drop shipping model where they partner with suppliers to fulfil orders and minimize the need for inventory storage. Also are the subscription box services where SMTEs can create subscription-based services, delivering products to customers regularly, and fostering customer loyalty. Examples include Birchbox and Blue Apron.

2.4.1 Adoption

Adoption of e-commerce can be seen as technological innovation adoption involving different stages (Parra-Sánchez & Talero-Sarmiento, 2024), a multistage process involving three stages; adoption, implementation, and post-implementation (Venkatesh et al., 2012). The adoption stage is the decision-making phase to adopt new technology, the implementation stage is the execution stage of the new technology, and the post-implementation stage is a post-evaluation phase that provides organizational learning. So, e-commerce adoption follows a logical time sequence (Nwosu, 2017a).

From the perspective of transactions, the adoption of e-commerce progresses Nwosu (2017) from using technology to carry out low-level activities to the usage of advanced and integrated technologies to perform a sophisticated commercial transaction (Chijokwe & Yin, 2020).

The three-stage e-commerce adoption by firms as proposed by Elsmani, Rahim, and Mohammed (2017) includes non-interactive e-commerce adoption as the first stage, interactive e-commerce adoption as the second stage and the third being stabilized e-commerce adoption, which is the stage at which an SME can use the e-commerce to carry out web-based transactions such as the online purchase of goods and services (Nwosu, 2017a), while the final stage involves someone able to execute full commercial transactions from the enterprise website.

However, the argument, is that the level of adoption of e-commerce by SMEs in different countries within Africa, Asia, and the Middle East could be said to be low Mohammed et al. (2013) such as in Kenya Chepngeno (2017), Malaysia Ahmad et al. (2020), Pakistan Nazir (2023) in Nigeria (Fauzi & Sheng, 2022). While low in these countries, it is argued that these are at the basic levels which are at the non-interactive adoption stage and only restricted to the use of the internet to carry out basic activities (Asare et al., 2012) similarly so in Nigeria (Taiwo, 2016) while 43% of the SMEs in Kenya lack functioning websites, 31% operated static websites, 22% operated active interactive websites with customers and only 4% engaged in online sales (Nwosu, 2017a). So many cannot support the execution of full commercial transactions based on the basic level of their operations.

Though this is not the case with the developed economies with developed infrastructure and regulatory systems to support e-commerce (Nwosu, 2017a) as against infrastructural challenges faced by the SMEs in the developing economies (Abou-Shouk et al., 2013) and still faced the adoption of e-commerce, challenges such as infrastructural limitations, lack of adequate financial resources, appropriate legal and regulatory frameworks cultural bias (Elsmani et al., 2017) instead of success factors from the deployment of e-commerce such as payment systems, institutions by developed economies (Treiblmaier et al., 2008)

Meanwhile Jones, Morrish, Deacon, & Miles (2018) in their research highlighted that influential owners in a firm responsible for decision-making are likely to adopt technology when they perceive clear benefits from digitizing. Meanwhile, digital transformation characterizes as disruption, asserting that the ongoing creative destruction is defining a new age and transforming the economy. Derchi further emphasizes the

necessity for organizations to adapt to this disruption by innovating for the future and making changes toward the unknown.

Therefore the need for greater integration of e-commerce and ERP systems adoption as against individual adoption to ensure maximum efficiency and competitiveness (Mohammed et al., 2013) including effective customer relationship management, inventory management, and seamless order processing (El-ebiary et al., 2022), as ensuring effective integration will require investment in the right tools, alignment of business processes with the digital platforms, and ensuring adequate personnel training (Parra-Sánchez & Talero-Sarmiento, 2024).

Therefore, a conducive digital business environment can facilitate the adoption and implementation of digital technologies in SMEs (Liebenau, Yu, and Lee, 2019).

2.4.2 Implementation Strategy

Implementation strategy for e-commerce, therefore, is how an enterprise deploys this tool in sustaining its competitive advantage in the online market space (Unmesh, Sumesh, and Soman, 2022), with differentiation through marketing, efficiency, and innovation as three strategy dimensions and adopting any of these strategies by SMEs is necessary for success (Marcelo Torres et al., 2014). So clearly e-commerce goes beyond just the acquisition of ICT tools but having a strategic roadmap for its implementation (Nwosu, 2017a) and a holistic consideration of all factors, technology, and non-technology. In a study of SME adoption in Indonesia, (Sari et al., 2023) findings revealed four factors namely, perceived benefits, compatibility, technology readiness, and government support significantly influence the adoption of e-commerce, whereas customer/supplier pressure does not have an influence.

Further on implementation strategy, the resource-based view (RBV) theory provides insights into the research objectives relating to an appraisal of the impact of e-

commerce and ERP systems on operational efficiency and financial outcomes of SMTEs in Lagos Nigeria and so, how the SMTEs can leverage digital technologies as strategic resources to achieve a competitive advantage, operational efficiencies and financial performance as understanding the implementation strategies for e-commerce and ERP systems is crucial for assessing their effectiveness. This is exemplified by the study that examines the adoption of e-commerce by SMEs in Nigeria, assessing its impact on business performance (White, Afolayan, and Plant, 2014).

Factors that could influence the adoption and implementation of e-commerce & ERP Systems. Understanding the factors that could influence the adoption of e-commerce is important as these could help in its adoption and ability to manage implementation challenges (Moshood et al., 2020) and could also said the government in providing policies and programs to help mitigate the identified challenges. Different models and frameworks were used by researchers in arriving at this, such as the DOI model to investigate e-commerce adoption factors among SMEs (Wymer & Regan, 2005), TOE framework (Ahmad et al., 2020; Moshood et al., 2020) for similar investigation, a multi-framework perceptive incorporating the TOE model/framework and the theory of planned behavior (TPB) (Awiagah, Kang, and Lim, 2016) to investigate the factors that influence e-commerce adoption in SMEs in Ghana (Nwosu, 2017a).

These showed mixed results on the relationship from technological, organizational, and environmental contexts. So, while technology, organization, and environmental contexts all have a positive influence on SMEs' adoption of enterprise applications (Moshood et al., 2020) investigation on the adoption of enterprise applications using data collected in the Northwest of England, findings from (Rahayu & Day, 2015) posits that environmental context does not influence e-commerce adoption, so not consistent with the findings of Moshood *et al.* (2020) that perceive environmental pressure influenced the

adoption of all e-commerce technologies by SMEs in Malaysia, but organizational contexts and technological contexts could have influence and so consistent with those of Moshood *et al.* (2020) The implementation of digital technologies therefore often necessitates specialized knowledge and skills in areas such as data analytics, cybersecurity, software development, and IT infrastructure management. SMEs in the textile industry may struggle to recruit and retain employees with the necessary technical expertise or face difficulties in affording external consultants or training programs. This lack of technical expertise can hinder the effective implementation and utilization of digital technologies (Thirumal et al., 2024).

Prior knowledge and experience of ICT are other compelling reasons that could influence management's decision to adopt new technology such as e-commerce (Rahayu & Day, 2015) as is the case in Indonesia, and such knowledge reduces the risk of uncertainty of ICT benefits (Awa, Ukoha, and Emecheta, 2016). However, a position not consistent is that of (Parra-Sánchez & Talero-Sarmiento, 2024) that knowledge and experience in ICT did not influence the adoption of e-commerce by SMEs in Iran, though in India, Malaysia, and Iran (Solaymani, Sohaili, and Yazdinejad, 2012) views is that lack of knowledge of ICT and understanding of e-commerce is one of the barriers to adoption of e-commerce in these three countries including Nigeria. These are inconsistent findings among these researchers.

Perceived compatibility with existing systems in the firms and values, culture, and processes are arguably another positive consideration (Ahmad et al., 2020; Rahayu & Day, 2015). So, compatibility is a reason for SMEs' adoption of enterprise applications Ramdani, Chevers, and Williams (2013), consistent with the findings of Ahmad *et al.* (2020) but a contradictory statement by Rahayu and Day (2015) that perceived compatibility is not a factor that influences SMEs adoption of e-commerce by SMEs in Indonesia. However,

Nwosu (2017a) noted the research findings of Senarathna et al. (2014) that different organizational values and cultures have a positive correlation on e-commerce adoption and a negative correlation between hierarchy culture and e-commerce adoption" and so summed up that a fit with existing business processes, infrastructure, culture, and values could be a major factor in SMEs considerations for adoption of e-commerce.

The support of the management of ICT and other development initiatives is also another critical consideration Awiagah et al. (2016) as is the case in Ghana SMEs in, the same position (Asare et al., 2012). Resistance to change is another consideration. The implementation of digital technologies often requires a shift in work processes, organizational structure, and employee roles. Resistance to change can arise from fear of job displacement, concerns about new technologies' reliability, or a reluctance to acclimate to new working techniques. Overcoming resistance to change through effective change management strategies and employee engagement becomes crucial for the successful implementation of digital technologies (Damawan & Azizah, 2020).

Another major consideration by the SMTEs is cost, noting that an understanding that the costs of implementation is to be high, there is likely to be a low commitment to adopt ICT and e-commerce due to their limited resources (Parra-Sánchez & Talero-Sarmiento, 2024) particularly in emerging nations such as South Africa, Nigeria, Malaysia India, Iran Implementing digital technologies usually necessitates a substantial initial expenditure on software, hardware, infrastructure, and training. Those with limited resources, for instance, find it difficult to allocate funds for such investments. So, financial constraints can impede the acceptance and effective utilization of digital technologies, preventing SMEs from reaping the full benefits of digital transformation (Han et al., 2019).

Costs therefore could be a barrier especially so in Nigeria, where the SMEs might not have enough income to make the necessary ICT investments such as computer

purchases, broadband and internet connectivity tools, and recurring costs of internet subscriptions (Taiwo, 2016) However, a contrary view in Indonesia, as depicted by research findings (Rahayu & Day, 2015) that the perceived costs of e-commerce adoption do not persuade the SME's e-commerce implementation in that country. Based on the limited resources of the SMEs, perceived high costs could be a serious barrier to their e-commerce adoption (Nwosu, 2017a).

Infrastructural limitations such as physical and regulatory infrastructure are another fundamental bane. Such bane includes slow speed of internet connectivity, insufficient availability of broadband internet connectivity (Buowari, 2015), Nigeria's electrical grid is unstable, and there is no policy in place to ensure the safety of online transactions (Taiwo, 2016). These consistent with the research Fauzi and Sheng (2022) that the mechanisms for establishing and enforcing laws and regulations to support e-commerce adoption is a barrier among SMEs in Nigeria.

The size of the firm is another consideration, location of the firm Awa et al. (2016) as those located in the cities are more probable to accept e-commerce technologies, the industry in the firm is operating (Ramdani, Chevers, and Williams, 2013) as those operating in retail, manufacturing, and service industry are more likely to adopt e-commerce, demographic disposition of top management such as gender, age, education (Nwosu, 2017a) and that those more sophisticated are more expected to accept the e-commerce than those less cultured, etc.

Cultural barriers are also a factor such as organizational culture, management style, and attitudes towards technology can pointedly influence the acceptance and utilization of digital tools. For instance, hierarchical organizational structures or a lack of openness to innovation and experimentation can impede the effective adoption and integration of digital technologies. Overcoming cultural barriers requires a proactive approach to change the

mindset and cultivate a culture that embraces digital transformation (Ramdani, Chevers, and Williams, 2013).

2.5 Growth of E-Commerce & Models in Lagos Nigeria

This is another segment of the literature review that informs the research objective of an appraisal of the current level of adoption of e-commerce and ERP systems among SMTEs in Lagos Nigeria in addition to determining and examining the drivers and limitations impacting the e-commerce implementation and ERP systems amongst the SMTEs, understanding the progress of e-commerce models and providing the context for assessing the potential impact of digital transformation on SMTEs.

E-commerce in the recent past has grown within the advanced economies exacerbated by globalization, which can be seen as the incorporation of local and nationwide economies through trade and transport, communication, etc. as a key driver for this growth and so increased competition making firms to adopts information-technology based strategies to remain competitive (Vladimirov, 2015). It is stated that globally, sale of ecommerce grew from US$10 trillion in 2012 to US$ 270 billion in 2000, while it was Eur241 billion in 2011 within the European Union (Gomez-Herrera, Martens, and Turlea, 2014).

Therefore, through globalization, opportunities are created for enterprises and business owners to access and make their services available to people across countries. Intra and extra-country trade, the opportunity to access foreign markets, though involves some costs, risks, changes in behavior (cultural change), knowledge, and process change.

In order to thrive in today's globalised economy, small and medium-sized enterprises (SMEs) must adapt their competitive tactics to make the most of their limited resources. One option is to use e-commerce technologies to break into international markets, rather than directly compete with giant corporations (Savrul, Incekara, and Sener,

2014). Therefore, it is for the SMEs to devise a business model depending on the transactions that they are involved in (with individuals, governments, and businesses) that work for them.

2.5.1 The Case of Lagos Nigeria

Digital technologies have the possible to revolutionize the operations of SMTEs in Lagos Nigeria and drive efficiency, competitiveness, financial improvement and sustainable growth. However, the SMTEs in Lagos Nigeria encounter various implementation challenges that hamper the effective adoption and digital technology deployment. Such challenges as “financial restraints, lack of technical knowhow, infrastructural limitations, resistance to change, and cultural barriers.

Nwosu (2017a) noted that the lack of e-commerce strategies such as SMEs in Nigeria have been slow to embrace e-commerce due to challenges with service delivery, dynamic marketing, and learning and adaptation on the part of SME business owners. While e-commerce adoption by SMEs should not be compared with that of large businesses, and with the potential benefits of e-commerce adoption, (Nwosu, 2017a) referencing (Moshood et al., 2020) noted that the adoption of e-commerce by SMEs in Nigeria is low and these can be attributed to the unique characteristics of SMEs, such as the SMEs limited capacity to adopt new technologies due to limited resources, ownership structure (Savrul et al., 2014) short term priorities and internal operations.

So, while the adoption level of e-commerce is low in Nigeria and at the basic non-interactive level Taiwo (2016) based also on the above-identified barriers, the majority of small and medium-sized enterprises (SMEs) rely only on electronic communication channels, such as email and websites, to showcase their products (Nwosu, 2017a). Empirical research have shown that there are a number of obstacles to the widespread use of electronic commerce, including a general lack of familiarity with the concept,

misconceptions about the high costs of implementation, and an absence of necessary resources (Taiwo, 2016) for investment in ICTs. Others include size, perceived risk of implementation, epileptic nature of electricity, lack of legal and regulatory frameworks (Buowari, 2015; Fauzi & Sheng, 2022), cultural band carriers, and location.

With more and more Nigerians able to use the internet and more and more brick-and-mortar stores opening up shop online, e-commerce and enterprise resource planning (ERP) systems have good potential to expand in the country (Buowari, 2015), a growth of 45million users by December 2011 to over 77million by December 2014, with the Nigerian mobile GSM operators accounting for 99.7% of the total active internet subscriptions (Enahoro & Olawade, 2021), these numbers indicating a loud increase (Nwosu, 2017a) in the internet users individuals since 2000. These numbers continue to grow.

The implementation of digital technologies in SMEs in the textile industry offers immense potential for enhancing operational efficiency and sustainable financial growth. However, several obstacles must be overcome in order to guarantee a fruitful rollout, barriers to change, limited resources, and insufficient technical knowledge, and cultural barriers are key challenges faced by SMEs. By recognizing these challenges and implementing appropriate strategies such as securing financial support, fostering technical skills development, engaging employees in the change process, and promoting a supportive organizational culture, SMEs in the textile industry can overcome implementation challenges and leverage digital technologies to their advantage.

2.6 Key Success Factors and Best Practices

Key success factors and best practices for SMEs in Textile Enterprises Bilal et al. (2024), adopting data-driven decision-making Eze et al. (2018), and learning from industry examples contribute to successful outcomes. By implementing these strategies and lessons learned, Consequently, it is crucial that SMEs are able to realise the full benefits of digital

transformation in order to attain long-term financial success. These success factors include the following.

1. **Clear Digital Transformation Strategy:** Small and medium-sized enterprises (SMEs) should establish a well-defined digital transformation strategy that supports their overall company aims. The strategy should identify specific digital technologies to adopt, define implementation roadmaps, and outline metrics for measuring success (Vaska et al., 2021).
2. **Leadership and Change Management:** Strong leadership and effective change management are crucial for successful digital transformation. SMEs should have leaders who champion transformation, communicate its benefits, and drive organizational change. Employee engagement and involvement are key to overcoming resistance to change and ensuring the successful adoption of digital technologies (Kraus et al., 2022).
3. **Talent and Skills Development:** Building a skilled workforce capable of leveraging digital technologies is essential. There has to be an increase in digital literacy, and SMEs should fund initiatives to teach people new skills. and technical expertise among employees. Collaboration with educational institutions and partnerships with technology providers can also support talent development (Allam et al., 2020).
4. **Customer-Centric Approach:** It is critical to prioritise the needs of customers for sustainable financial growth. SMEs should leverage digital technologies to understand customer needs, preferences, and behaviours. By utilizing data analytics and customer relationship management tools, SMEs can personalize customer experiences, improve satisfaction, and drive revenue growth (Mick, Kovaleski, and Chiroli, 2024).

5. **Ecosystem Collaboration:** Successful SMEs engage in collaboration with external partners, including suppliers, customers, technology providers, and industry associations. Collaborative initiatives such as joint research and development, co-creation of innovative solutions, and knowledge sharing contribute to competitive advantage and sustainable growth (Jean, 2024).
6. **Scalable and Agile Technologies:** SMEs should prioritize scalable and agile technologies that can adapt to evolving business needs. Cloud computing, mobile applications, and software-as-a-service (SaaS) models provide flexibility, scalability, and cost-efficiency. Such technologies enable SMEs to optimize resource utilization and quickly respond to market demands (Bilal et al., 2024).
7. **Data-Driven Decision Making:** SMEs should embrace data-driven decision-making, collecting, analysing, and utilizing data effectively enables SMEs to gain insights, identify trends, and make informed business decisions. Implementing data analytics tools and establishing data governance frameworks are crucial for extracting value from data (Eze et al., 2018).

2.7 Overview of the Nigerian Textile Industry & Government Policies

This subject provides understandings into the present situation of the sector and its readiness for digital transformation. So, its understanding informs the research objectives of appraising the current level of adoption, determining and examining the drivers and limitations, the e-commerce effect and ERP systems on SMTEs' operational efficiencies and financial performance, and also determining the major challenges observed during implementation including proposing workable solutions to mitigate identified challenges.

In Nigeria, the textile sector was second largest in Africa after Egypt before 1997 and had over 250 vibrant factories, with over 50% capacity utilization (Owen, Ogunleye, and Orekoya, 2016a), employed over 1 million (second to the government in the 1970s and

1980s), Government accounts get more than N1 billion from a captive market that holds 250,000 tonnes of raw cotton for growers.

Towards the end of the 1990s, the industry took a nosedive and stopped to be a crucial role in generating jobs and bringing in foreign currency and so by 1997 was the influx of imported inferior products and textiles from countries such as China as the government removed the ban on the importation. This then brought about the strangulation of the local textile market as most abandoned their production for imports, resulting in loss of employment criminal activity, and insecurity of lives consequently resulting in the closure of 50 industries, loss of over 80,000 jobs, reduction of capacity utilization to merely 28% from 60% leaving only about 34 textile companies as 2009, with less than 25,000 workforces (Myers, 2023).

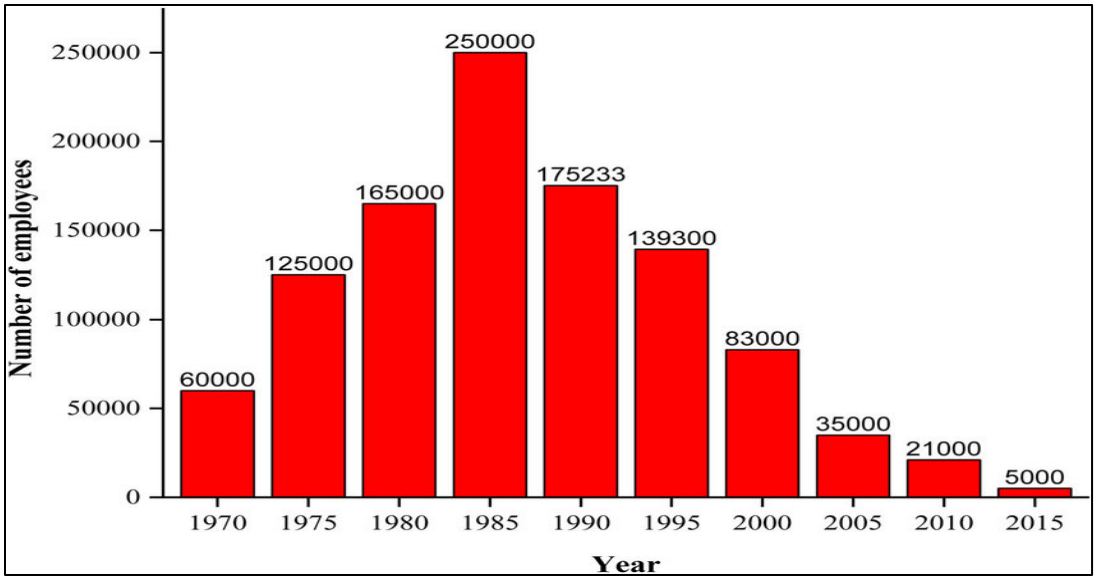

Figure 2.1: Data about Textile Industry Employment in Nigeria
(Source: Fieldwork 2015).

In Lagos State for instance (Adeola Abiodun ADEOTI, 2024) noted the below listed as closed within the period, “Aswani Textiles, NSF, Diamond Spinners, Rheka Industries, Emar Textiles, Mayfair, Aflon, Arcee, Texlon, Royal Spinners and Tarparlin

Nigeria Limited, in addition to International Textile Industry (ITT) with 800 jobs lost, First Spinners with 500 job loss, Bhojson Textile Industry with 700 job loss and Reliance Textile with 500 job loss, resulting from infrastructural decay and lack of modern technology in addition to high cost of production (Nwabueze, 2009), Other reasons include "inconsistent government policies such as the country's accession to the WTO (World Trade Organization) in 1995 and so removing the protection of local textile industry in line with WTO rules (Adeola Abiodun ADEOTI, 2024) and not securing the protection of the local textile industry practitioners prior, in addition to ending the Multi-Fiber Agreement (MFA) and the accession of China to WTO, inadequate power supply, introduction of AGOA (African Growth and Opportunity Act) shortly before the expiration of MFA, which then increased the Chinese quota of exports to the US, as their exports were cheap and so resulting in the decrease of African exports which used to be high to the US, smuggling of foreign textiles, insecurity etc., hostile operating environment, unfriendly political and economic environment",

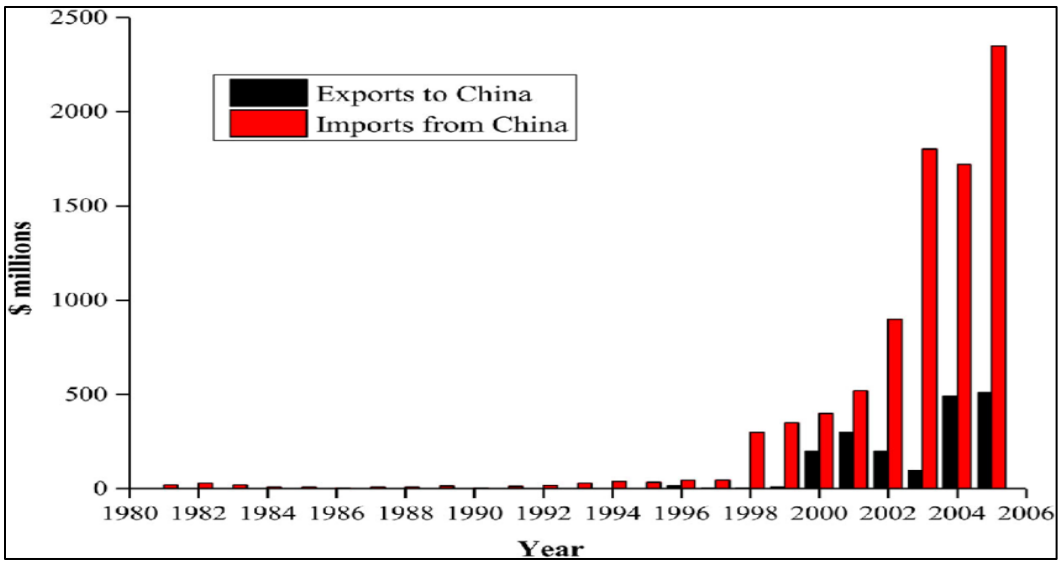

Figure 2.2: Sino-Nigerian trade 1980 – 2005

(Source: adapted from IMF (2006), cited in Adebajo and Mustapha 2008)

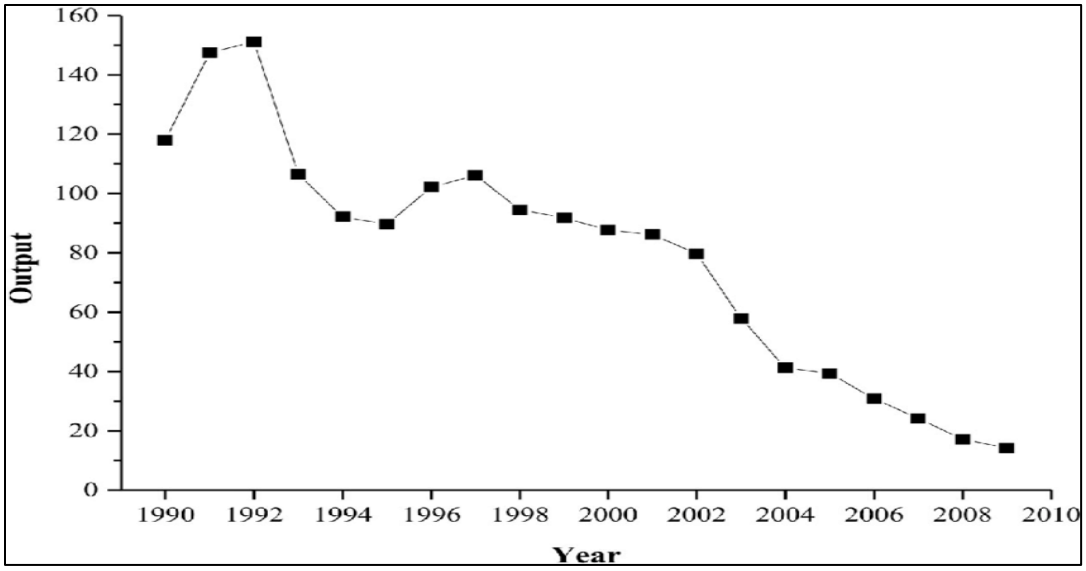

Figure 2.3: Production index for Nigerian textiles from 1990 to 2010
(Source: Central Bank of Nigeria and Fieldwork 2015)

2.7.1 Intervention by Government and policymakers (Policies and Initiatives)

This segment of the literature review deals with an examination of the government policies and interventions in the sector as this plays an important role in SMTEs' digitalization efforts. Therefore, this subject is critical and plays a important role in shaping the business environment, including influencing the digital transformation initiatives.

Therefore, an understanding of the various factors such as government policies, financial incentives, and supportive frameworks is vital for endorsing sustainable growth in the digital era (Saeedi & Ashraf, 2024). These factors have influenced SMEs employment of digital technologies and promoting digital transformation.

Several policies and initiatives have been implemented by the Nigerian Government over time aimed at supporting and promoting SMEs in adopting digital technologies, and enhancing digital infrastructures, providing financial incentives, and creating an enabling regulatory environment. However, most of these have not achieved the desired outcomes (Ochen, 2024).

While the textile sector in Nigeria has been identified as a central and chief area capable of attracting US$ 1.9 billion in investment by 2019 and N3.2 billion (US$ 11.3 million) in annual value under the government's economic recovery and growth plan (Odey et al., 2018), following the rapid decline and deaths of companies in this sector, part of the Government's intervention to revive the sector was the establishment of N100Billion Cotton, Textile and Garment (CTG) Revival Funds by January 2004 and December 2009. The original plan called for the Bank of Industry (BOI) to oversee this fund", however, the many complaints following the establishment of the fund were that the scheme did not achieve the intended objectives due to inconsistent government policies, including the release of funds without consideration of cotton and modern production technologies and lack of enabling environment, such as power, and smuggling.

However, by 20th January 2015, the Federal Government of Nigeria again and through the Central Bank of Nigeria vide an Act which 'provides enhanced market access for certain goods from qualifying countries in Sub Saharan Africa including Nigeria', the Government launched a fresh N255Billion Investment Funds, to revive the industry and by providing loans at single digits to CTG industry under the Real Sector Support Facility (RSSF).

Further towards reviving the industry, the Nigerian Central Bank through the then Governor of the Central Bank, Mr. Godwin Emefiele also set up a panel to investigate the revival of textile firms and to set up at least 50 additional textile firms by 2023. However, all of these initiatives, interventions and funds did not yield the desired results.

Further, while injecting funds into the sector is good (Sheila, 2024)noted believe it is preferable to develop a "sustainable enabling environment" marked by consistent policies, low operational expenses, and access to long-term bank funding in order to stimulate economic activity and make it easier to create new jobs. This is in addition to the

implementation of the CTG policy which could be seen as another milestone towards Nigeria's Industrial Revolution and for sustainable development.

However, one identified constraint was the ability to attract foreign investors. As an incentive to ensure this, the government offered tax-free imports of equipment and imports of equipment to year 2019 as well as a three-year tax holiday (Oxford Business Group, 2017).

Further policymakers' proposals to enhance SMEs included the development of non-bank lending services, by creating an incentive for SMEs to access finance through Banks and financial institutions by reducing capital requirements, stop shops as well as online platforms (World Bank Group, 2019), which also includes the provision of low-cost loans to SMEs by government-linked development banks working with the private sector. Alternative financing from one's business networks, private equity firms, or peer-to-peer financing, or venture capitalists (Velthuijsen et al., 2018).

For SMEs to remain relevant, competitive, and innovative, it was therefore advised that it is provided for them, e-training and learnings across several business areas enable them to leverage emerging digital technologies to remain competitive and innovative-driven growth (Quinton et al., 2018). Therefore, there is a need to develop and promote innovation and entrepreneurship including developing dedicated institutions for the development of SMEs (Lukonga, 2020).

SMEs are required to ensure knowledge spillovers and access to networks just like the advice by the European Union of using studies and knowledge transfers, effective use of various digital tools for their business offerings, and cooperating with established tools/platforms and leading industries (Velthuijsen et al., 2018).

So, to forestall decline, CEOs in the textile industry must invest adequately in modern textile technology as in a (YUSUF, 2015) study that "inadequate investment in

modern textile technology led to the production of low-quality products resulting in the collapse of the textile industry in Northern Nigeria". Therefore, to maintain a competitive edge in the long term, there is the need for SMEs to be innovative in their product offerings and deploy digital strategies (Matt, Modrák, and Zsifkovits, 2020), on top of the fact that digital production methods present a chance for SMEs to harness their talents and pave the way to sustainability.

SMEs have a lot of ways and opportunities to develop their technology infrastructure, as there is a "ubiquity of non-proprietary technologies and access to open platforms (Morgan-Thomas, 2016) and so, (Eller et al., 2020) provides SMEs with a lot of opportunities to develop their technology infrastructures.

Consequently, SMEs can develop their businesses (Priyono et al., 2020) by digitalizing certain aspects of their businesses and adopting digital technology to change their value proposition, value creation, and value capture mechanisms and clearly defining the level and scope. The use of social media for example can also positively influence the financial performance of SMEs, by reducing marketing costs while improving customer relationships.

Though, it is understood that SMEs are behind larger businesses when it comes to digitization, (Eller et al., 2020) and that this hurts firms' performance. However, the understanding is that SMEs have certain advantages which the larger firms do not have, and that is their small size, which gives them the flexibility to easily innovate including their coherent culture (Shepherd & Majchrzak, 2022).

2.8 Challenges of Digitalization and digital transformation

There are potential arguments that digitalization and digital transformation can in certain instances harm the growth of small and medium-sized textile enterprises (SMTEs) including those in Lagos Nigeria. These challenges can be seen as disruptions whose

effects are Derchi (2022), including amongst others, the high cost of digitalization, aligning with research showing that 28% of the surveyed companies still think that digitalization is costly, which involves the hardware and software infrastructure, high costs of training on the use of the platforms, and that such huge financial involvement may hamper the small and medium-sized textile enterprise (SMTEs) operating efficiencies and financial performance.

Another challenge is the issue of accessibility and connectivity of digital technologies, noting that technological tools will require access. accessibility is seen as a technical challenge (Botelho, 2021) especially so in Lagos Nigeria where power and electricity are known to be a huge problem and highly inefficient. SMTEs suffer from an epileptic power supply, so they often result in providing power/ through the purchase and use of generators, petrol, and diesel themselves for their business operations which in turn leads to an increase in their operational costs due primarily to insufficient and adequate telecommunication cables and connections.

There is the challenge of skill gap, more so as digital technologies are constantly evolving, and so there is the constant need to update and relearn (Derchi, 2022), even though new technologies will be useful even for the next ten years might not be readily available to the small and medium-sized textile enterprises (SMTEs). Therefore, time and resources might be expended in trying to upskill the labor force of those operating within the industry. So, the constant evolution of technologies causes disruptions in the traditional business models of textile industries including a reduction in the need for manual labor and consequently job losses as the evolution generates real-world social problems (Derchi, 2022) such as fear and insecurity of losing jobs, bringing about a hard hit for the local workforce.

Following, digital transformation could create a shift from the traditional textile enterprise, where the human factor has always been a great advantage, especially in craftsmanship creativity and customer relationships, so jeopardizing the unique value proposition.

Digital transformation could have a huge financial impact on the enterprise and increased reputational risk as there could be a tendency to be over-reliant on these digital tools by the SMTEs. Such overuse could occasion data breaches and open the enterprise to cybersecurity threats and regardless of what "digital transformation" means for an enterprise, there is increased focus and threats posed by security (Melnyk et al., 2024).

The dynamic development of information and communication technology (ICT) has caused huge changes in the global economy, resulting in digitalization lowering the barriers and enabling easy access to markets both regionally and internationally lowered such easy entry brings about increased competition which puts pressure on the SMTEs and could bring down their market share and sustainable financial growth.

While the above are potential challenges to digitalization which could have adverse effects on SMTEs' operating efficiencies and financial performance, the researcher notes that most of the research in this area has argued favorably on the potential upsides and benefits of digitalization and digital transformation. However, this research aims at addressing the identified gap in this sector.

2.9 Assessing the Readiness of SMTEs in Lagos Nigeria for Digital Transformation

Digital transformation has the potential to drive growth and competitiveness in SMTEs in Lagos Nigeria. However, assessing the readiness to embrace digital transformation is crucial to understanding their preparedness and identifying potential barriers. This assessment focuses on key factors such as technological infrastructures,

digital skills of employees, and the overall digital readiness of the business environment such as technological infrastructures, digital skills of employees, and the overall digital readiness of the business environment.

The RBV is critical as it can inform the assessment of the internal strengths and weaknesses of SMTEs' readiness for digital transformation, noting that this subject involves evaluating their capabilities, resources, and organizational readiness to adopt and implement digital technologies. Adequate technological infrastructures, the presence of digital skills among employees, and a supportive digital business environment are crucial for successful digital transformation. By addressing gaps and barriers in these areas, SMTEs in Lagos Nigeria can enhance their readiness for digital transformation and unlock the potential for sustainable growth and competitiveness.

The overall digital readiness of the business environment in Lagos Nigeria also impacts the readiness of SMEs for digital transformation. This includes factors such as government policies and regulations supporting digital innovation, availability of financial support and incentives for digital initiatives, and the presence of a supportive ecosystem of technology providers, business networks, and industry associations. A conducive digital business environment can facilitate adoption and implementation digital technologies in SMEs (Liebenau, Yu, and Lee, 2019).

The suggestion therefore is for government policies and regulations to provide financial incentives and supportive frameworks aimed at encouraging SMTEs in Nigeria to adopt and implement digital technologies, such as providing access to funding, training programs, mentorship, and networking opportunities to foster digital transformation and sustainable growth (Quinton et al., 2018). Such policies and financial support incentives include financial support in the form of grants, subsidies, or low-interest loans to encourage SMEs to adopt digital technologies, which can be used to invest in hardware, software,

training programs, or consultancy services related to digital transformation (Enoch O. Alonge et al., 2024).

2.10 Sustainability – Environmental, Social and Governance (ESG) Perspectives

Sustainability and social impact, such as environmental and social could have a considerable impact on digital transformation in the SMTEs, and the interplay between sustainable supply chain practices and digital transformation has the potential to enhance sustainability and resource efficiency (Raihan Uddin & Mamunur Rashid, 2022), the potential to improve environmental and social impact within supply chains including the textile industry (Stadnicka & Litwin, 2019). Consequently, digital technologies can contribute to the sustainability performance of SMEs. Therefore, the integration of sustainability principles into digital business transformation strategies can help SMEs leverage digital technologies to drive sustainable practices and social impact.

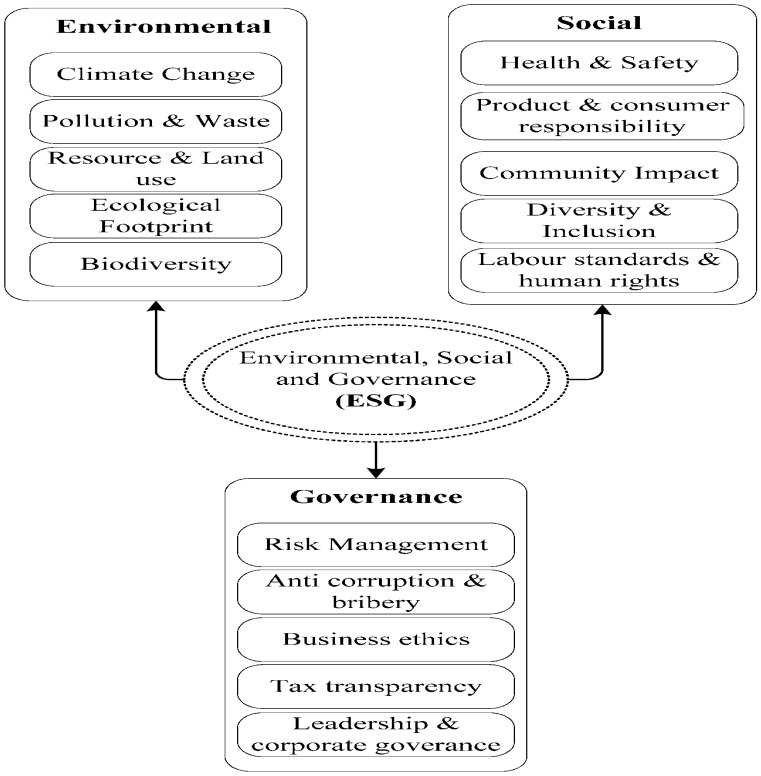

Figure 2.4: Elements of Environment, Social & Governance

Consequently, to build a sustainable future, firms would have to embrace ESG as a strong founder, as it will help such firms deliver natural positive outcomes and long-term value.

Entrepreneurs and management executives of small and medium-sized textile enterprises (SMTEs) should see sustainability as both an opportunity as it would help in addressing some of their business needs, including expansion, capturing new markets, attracting and retaining talents, including the changing customer needs and responsibility. On sustainability, every aspect involving environmental, social, and governance (ESG) should be considered and measured alongside financial considerations. ESG is "primarily a risk management and investment framework that seeks to evaluate financial risks that environmental, social and governance factors pose for a company's value" adopting an 'outside-in' perspective, best described as an investor and company-centric framework which seeks to de-risk portfolios and increase the economic resilience of the company's" (Karim et al., 2024).

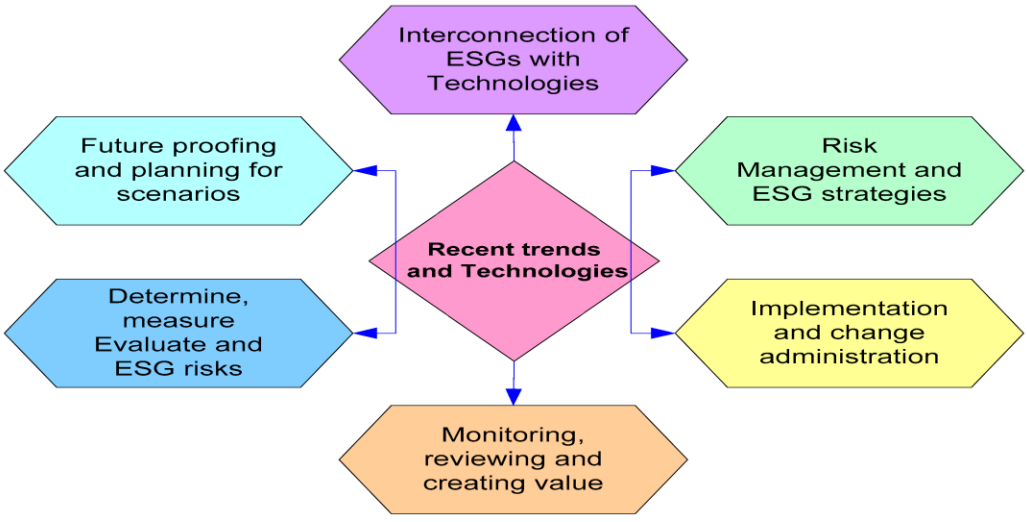

Figure 2.5: ESG Framework (Source: Saxena et a. 2023)

ESG is, therefore, about impact investments and sustainable thematic investments, which speaks to widening the principles of value creation when investing in a sustainable

portfolio, and great consideration on the impact of the business operations on the environment, creating positive social impact as well as making financial returns. the textile industry especially fashion has been in the spotlight in the last 2 to 3 decades regarding their contribution to worldwide ecological and community matters, ESG is a risk and investment management framework, and textile industry practitioners must be more into the various activities, products, and technology that form their investment portfolio (Karim et al., 2024) for a more sustainable future and by responding to these ecological as well as social issues within the context of CSR, (Kozlowski et al., 2012) noting that the in order to establish and execute suitable strategies and initiatives, it is important to identify stakeholders' interests, duties, and accountability.

Figure 2.6: ESG Integration (Source: Yue et al. 2020)

In their study of H&M (a Swedish multinational fashion company) noted that customers are increasingly aware and knowledgeable of the environment and that fashion companies should aim to develop a sustainable supply chain as that is the main linkage to sustainability, by depicting “a model for a sustainable fashion supply chain that

incorporates ethical consumers, eco-material preparation, eco-friendly production, eco-friendly transportation, and retail. Consequently, the fashion business places a premium on sustainability concerns because they make use of large quantities of water, pesticides, and chemical products, so they are very sensitive to the environment. The fashion industry is having a huge impact on the environment, with consumption estimated at over 30 million tons a year (Fauzi & Sheng, 2022), and so causes serious social and environmental impacts within the global supply chain. It should be mentioned that when it comes to the environmental impact of the apparel business, globalisation has allowed for the production of garments at incredibly low prices—so low that many customers view them as "fast fashion"—and that this has led to their disposal, yet fast fashion leaves pollution footprint with ‘each step of the clothing life cycle generating potential environmental and occupational hazards. According to Subic *et al.* (2012), the sporting goods sector is characterized by high and large production and consumption volumes, short product life cycles and so with high disposal rates. This is also because distribution globally is through tier-based supply chains and logistical systems, different capabilities of people in the supply chain, and so can impact the sustainability of the business in general.

Consequently, fashion is expected to be produced in a sustainable manner and with the guidelines of sustainability as per ISO 14000. This has become an important responsibility for today’s fashion and textiles manufacturers, noting that today’s consumers are also very aware and versed on environmental issues in that ‘if supply chain is more sustainable, more natural resources are used and less Co2 emissions, then increased retail prices. Provided the quality of eco-products is satisfied, customers from the research will be willing to pay a higher price (Fauzi & Sheng, 2022). The H&M sustainability program they initiated was called the “Conscious Action” The implementation of this initiative, there was resultant more job opportunities created in less developing countries, the use of

more recyclable products in production, and ethical education to consumers resulting in more economic, and environmental, and socially sustainable market and supply chain. It is understood from a case study that the textile SME integrates EMS with lean manufacturing principles to reduce waste and improve financial performance. The implementation focuses on identifying and eliminating non-value-added activities, optimizing material usage, and implementing waste reduction strategies. The study highlights the positive impact of EMS implementation on cost savings and environmental performance (Alkhoraif et al., 2019).

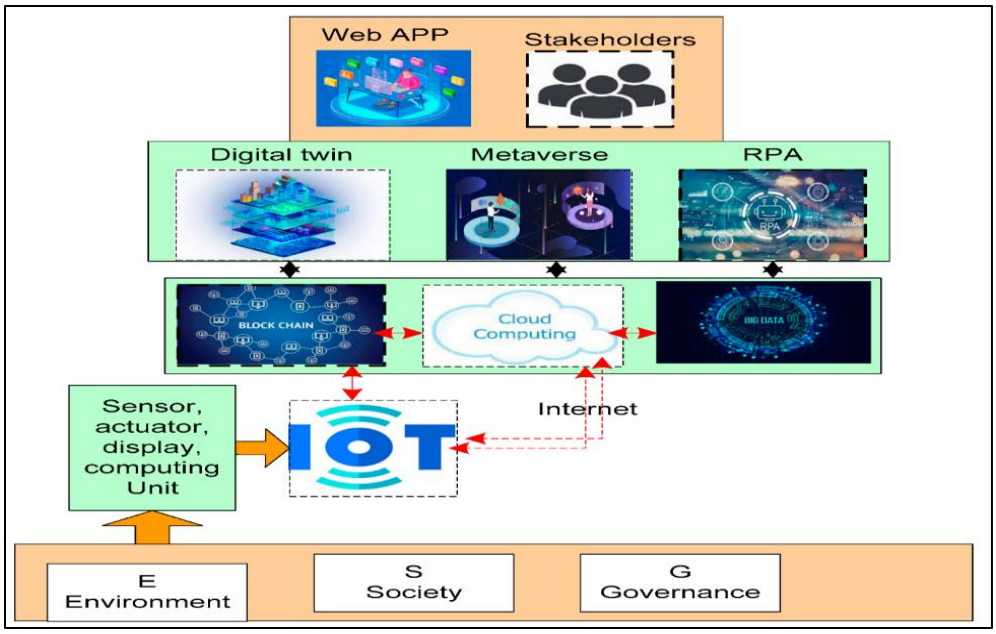

Figure 2.7: Emerging ESG Technology Phase (Source: Saxena et al. 2023).

So, while there are challenges in ESG data and reporting, Industry 4.0 can overcome these challenges. For instance, AI can provide a solution by acting as a catalyst for scaled sustainable analysis via technology analysis that filters important decisions as its framework serves as a driving force for humans to accelerate the necessary data in ESG metrics so that investors can understand which organization to invest. Moreover, blockchain allows firms to track sustainable efforts carried out with the intent of

sustainability and implementation of the same kind of approach for ESG collection (Saxena et al., 2022).

2.11 Summary

In summary, while there are potential challenges to digitalization and digital transformation, digital transformation, adoption, and implementation of digital technologies, the works of literature so far suggest that digitalization can play a significant role in enhancing the operational efficiencies and financial performance of small and medium-sized textile enterprises (SMTEs) in Lagos Nigeria.

The theoretical framework for this study provides a useful framework for understanding the role of digital technologies in achieving operational efficiencies and financial performance. The researcher notes that the digitalization wave cannot be said to be transitory but the beginning of a whole new era of general life and business (Shettima & Sharma, 2020), not just in Lagos Nigeria but the entire continent and even beyond., in that the 'whole idea of digitalization is the complete use of information and communication technology that facilitates accessing worldwide resources simultaneously beneficial for society' At the Africa Textile Manufacturing and Trade Policy Summit and Exhibition 2022 in Lagos, Chandramouli Kern, Consulate General of India in Lagos urged players in the textile industry in Nigeria to explore joint ventures and partnership with technological companies who have the expertise to measure up to expectations. So, to improve business efficiency, effective business practices (Mealer & Jones RN, 2014) opined that business executives should adopt and make full use of ICT to survive in the new business environment, in addition to helping to increase and achieve growth.

So, the textile and apparel (T&A) industry in today's smart manufacturing environment faces a lot of challenges resulting from a consumer-driven economy, such as efficiency, sustainability, product quality, regulatory compliance, and quick response to

clients. So to meet stakeholders' demand for eco-friendly and sustainable T&A products, enterprises are adopting most appropriate and suitable technological solutions and products (Ahmad et al., 2020) to deliver the best products, maintain long-term sustainability to enable them perform better and smarter in the 'fourth industrial revolution' or 'Industry 4.0' and by focusing on the triple bottom line approach; these addressed in their main managerial processes of production, manufacturing, retail, delivery, purchasing, and customers, in addition to relationships with suppliers, distributors and customers. According to Kozlowski, Searcy and Bardecki (2016), the design process can support the development of new and competitive business models for a sustainable fashion industry.

To successfully transform therefore, firms/businesses including those in the textile industry should devolve consistent and reliable ways to measure their digital performance as the lack therefore hampers organizations in their quest to transform successfully. These are "digital for operational efficiency, workforce engagement, customer engagement and new sources of value creations" Details of these are as per the below table culled from their write-up.

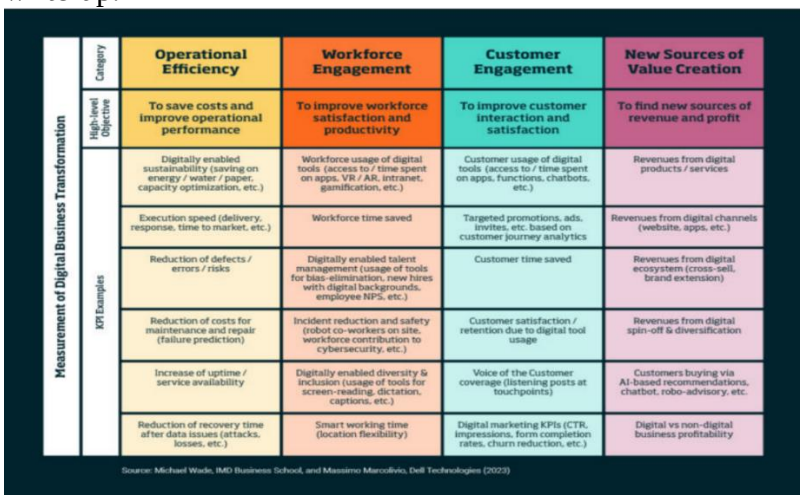

Figure 2.8: Measurement of Digital Business Transformation

Therefore, there is a need for further research on small and medium-sized enterprises' market access and competitiveness, and investigation of how digital platforms

and online marketplaces can enhance market expansion, customer reach, and international trade opportunities.

2.11.1 Definition of Key Concepts

- **E-Commerce:** This entails the purchasing and retailing of goods and services such as online shopping, and electronic payments via an online marketplace and over the Internet. Conceptually linked, e-commerce enables businesses including SMTEs to streamline their sales processes, reach a wider audience, access more markets, and enhance customer interactions and business thereby increasing sales and revenue.
- **ERP Systems:** This is an application used by businesses, and corporates to manage and integrate their operations which include inventory management, accounting, human resources, and customer relationship management. Conceptually linked by integrating these processes by way of automation and optimization, the application ensures better resource management and provides real-time decision-making capabilities consequently enhancing operational efficiency and cost reduction including overall productivity.
- **Digital Technologies:** Data generators, processors, and storehouses are these electronic systems, equipment, and resources. Apps for mobile devices, cloud computing, the IoT, and AI are all good examples. Conceptually linked, digital technologies serve as the foundation for e-commerce and ERP systems, facilitating their implementation and effectiveness, enabling business processes, improved communication, and data management enhancement.
- **Digital Transformation:** This refers to adopting digital tools, and practices to improve business processes, and innovation and drive customer experiences Consequently, the integration of several areas of a business using digital technologies consequently changes their operational models, delivering effective

and efficient service delivery, operational efficiency and value to both customers, drive innovation, improves business processes. The two go hand in hand conceptually; they are the acceptance and execution of online trade and ERP systems as part of a broader strategy of a business to improve their business operations for operational efficiency, and financial performance and achieve sustainable advantage, new markets, reduce inefficiencies, and reduce operational costs.

- **SME:** Notwithstanding the enormous involvement of SMEs to economies, the definition of SMEs varies among scholars, nations, and regions, and yet no universally accepted definition (Fauzi & Sheng, 2022) using indices such as the capital size, employee count, assets in the classification of what constitutes a micro, small and medium enterprise. In Malaysia, SMEs are service enterprises employing between 5 and 50 people in full employment, or five and 150 in manufacturing, while it is employees between 10 to 200 in Nigeria with assets of more than N5million and up to N500million in their classification.
- **Digital Transformation:** Digital transformation is defined as digital transformation as "an evolutionary process that leverages digital capabilities and technologies to enable business models, operational processes, and customer experiences to create value".
- **Digital Adaption:** This refers to a reaction to business needs by firms including SMTEs and by transitioning and adopting technological innovations which could include e-commerce and ERP systems to allow for better flow of data and synchronization between two systems, and workforce management, all towards greater efforts to add value to the business and improve their service offerings and consequently profit levels.

- **Sustainable Development:** Sustainable development is defined as “development that meets the present without compromising the ability of future generations to meet their own needs.” (Mulligan et al., 2024).
- **E-Commerce:** E-commerce is a strategic tool, an online marketplace for firms and enterprises deployed and implemented for their goods and services to achieve competitive advantage.
- **Sustainable Financial Growth:** Sustainable financial growth looks at measuring KPI such as revenue growth, cost reduction, market size, customer engagement, and satisfaction on SME performance, particularly focusing on revenue growth, cost efficiency and business performance, its impression on the company’s performance indicators, business outcomes, and the specific impact of digital transformation (Saxena et al., 2022).
- **Customer engagement and satisfaction:** These metrics measure the level of interaction and satisfaction customers have with enterprises, which can be indicative of operational efficiency. High engagement and satisfaction levels suggest that digital systems (like ERP systems or e-commerce platforms) are enhancing customer service, thereby leading to loyalty and repeat business. So, engaging and satisfying customers can indicate improved service delivery, product quality, and responsiveness, which are byproducts of enhanced operational efficiency and CRM systems.
- **Sustainable financial growth:** These broader metrics captures financial health and resilience over time, often showing the impact of cost savings, productivity improvements, and long-term planning enabled by technologies like ERP. It assesses whether the adoption of digital technologies is contributing to stable and scalable financial gains. Sustainable growth reflects efficient operations and the

ability to maintain or improve profitability over time, indicating that digital transformation enhances financial performance and sustainability.

The independent variables include the “adoption and implementation of e-commerce and ERP systems”. So, for the independent variables.

E-commerce adoption looks at the extent to which SMTEs in Lagos Nigeria adopt e-commerce for online sales, market, and customer engagement.

ERP systems – look at the degree of SMTEs' adoption of ERP systems for managing their resources, decision-making, and streamlining operations. The dependent variables include operational efficiencies and financial performance.

The dependent variables are therefore accessed using certain financial metrics such as increased sales, market size expansion, customer engagement and satisfaction and sustainable financial growth measured through “gross profit, net profit, return on sales (ROS), return on assets (ROA)”. The association between the independent and dependent variables providing theoretical grounding to operationalize the constructs and establish linkages between concepts.

CHAPTER III:

METHODOLOGY

3.1 Overview of the Research Problem

The purpose of this study is to investigate the extent of digital technology adoption and implementation among SMTEs in the textile industry in Lagos, Nigeria, as well as their effects on operational efficiencies and financial performance via the lens of digital transformation.

Though many are torn between a digitized future and a content-dependent past Fromhold-Eisebith et al. (2021) and how implementing 'Industry 4.0 production technologies could transform the textile industries for instance, the basic idea of digitalization using mixed-methods research methodologies will be to make use of information and communication technology facilities for accessing worldwide resources, beneficial for all within the ecosystem (Pal & Jayarathne, 2022b).

While the two main knowledge areas for this study are digitalization/information science and strategic decision-making/management, the study, therefore, requires an understanding of the benefits of digitalization, digital transformation, and digital technologies involved in the process and strategic decision-making and management implications on the textile industry digital technology implementation, while from the management perspectives, its impact on different managerial dimensions in strategy, operations, commercialization processes, logistics, and business models.

So, the primary research method for this study was a review of relevant works of literature, using of survey questionnaire, and interview as instruments of data collection and for textual analysis, while research methodology was the application of mixed-methods research methodologies to investigate common categories, inherent configurations of the level of adoption and implementation of digital technologies specifically e-commerce, ERP

systems and their impacts on SMTEs digitalization transformation, including growth measured by some key performance indicators such as increased sales, market size expansion, customer engagement and satisfaction and sustainable financial growth.

3.2 Operationalization of Theoretical Constructs

The theoretical constructs for this study are the Technology-Organization-Environment (TOE) and the Resource-Based View (RBV) theory. The TOE developed by Tornatzky & Fleischer in 1990 provides for understanding the adoption of technological tools by organizations and that technological, organizational, and environmental contexts enhance adoption. This was also espoused in the study of the Nigerian manufacturing sector (Amade, Ogbonna and Nkeleme, 2022; Aremu, Shahzad, and Hassan 2018). While the RBV argues that the strategic use of resources can lead to sustainable competitive advantage (Barney, 1991). The theory as was applied in their research which looked at the adoption of e-commerce by SMEs in Nigeria Nwosu (2017b) therefore speaks to how unique resources and capabilities such as advanced IT systems can provide competitive advantage.

Other theories that lay relevant to the study include. The diffusion-of-innovation (DOI) theory developed in 1962 by E.M. Rogers examines the complexities and ease of use as critical factors influencing technology adoption, identifying factors that influence the rate of adoption, such as relative advantage that speaks to that extent. The Service-Dominant-Logic (SDL) theory which was developed in 2004 by Stephen L. Vargo and Robert Lusch speaks to co-creation through the integration of processes such as service providers and customers, therefore the need to understand customer preferences, experiences and as applied in the studies investigating factors influencing adoption of e-commerce by SMEs in Kenya Chepngeno (2017), and the Transaction-Cost-Theory (TCT) formally proposed by Transaction cost theory: past, present and future (Rindfleisch, 2020)

deal with transactional costs including search, monitoring, negotiation, exchange, so firms choosing governing structures that minimize transaction costs with information asymmetry, coordination, monitoring, efficiency, reduced costs through an efficient selection of most appropriate governing structures and as depicted in research on factors influencing e-commerce adoption by SMEs in Nigeria assessing their perceived costs and benefits (Wirdiyanti et al., 2023). All of these theories lay relevant to the research topic and are operationalized by examining the extent or level to which SMTEs in Lagos, Nigeria, have adopted digital technologies and consequently leveraged these digital tools or technologies for operational efficiencies and financial performance.

Therefore, the operationalization of these theories was through the following constructs as depicted in Diagram 19 below. (defining of constructs) and by identifying the independent variables which are the adoption and implementation of digital technologies specifically e-commerce ERP systems, and the dependent variables which is operating efficiencies and financial performance, providing theoretical grounding to operationalize the constructs and establish linkages between the variables accessed using financial metrics of increased sales, market size expansion, customer engagement and satisfaction and sustainable financial growth measured by some key performance indicators such as return on assets, return on sales, gross profit/margin, net profit/margin, revenue growth, operating efficiency.

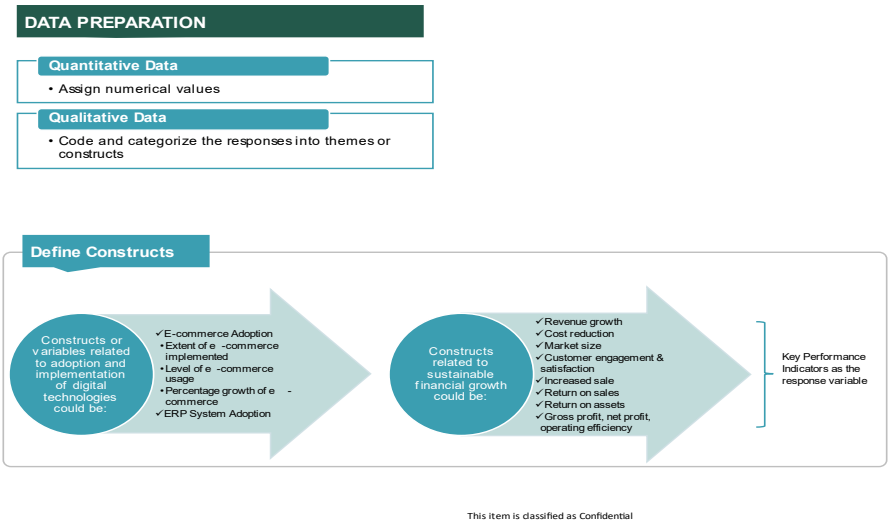

Figure 3.1: Define Constructs

The survey questionnaire, a Likert scale questionnaire, was designed based on the theories and administered to over 600 randomly selected SMTEs in Lagos, Nigeria. Responses were received from 400 of the participants.

For the qualitative analysis, responses were also received from participants on the open-ended interview questions around environmental, social, economic, government policies and regulations and political implications such as;

- What are the opportunities that digital transformation has brought to your textile enterprise? Please provide specific examples if possible
- Please describe any notable success stories or challenges related to the adoption and implementation of digital technologies in your textile enterprise
- Would you advise if digital technology has contributed to your sales figures? Either increase or decrease
- Are there factors that you can suggest that have contributed to your enterprise's sustainable financial growth?
- How have digital technologies improved customer engagement and satisfaction in your textile enterprises? Please provide specific examples if possible

- In your opinion, what are the essential steps that the Nigerian Government or relevant stakeholders can take to support small and medium-sized textile enterprises in their digital transformation journey?

The focal point for this research study is the defining of variables (constructs) as depicted in the below schematic diagram which relates to the adoption and implementation of digital technologies. E-commerce and ERP systems are noted as independent variables and to each of the dependent variables (operating efficiencies and financial performance) assessed by certain financial metrics of increased sales, market size, customer engagement and satisfaction, and sustainable financial growth measured with key performance indicators as gross profit, net profit, return on sales, return on assets, profitability ratios as the response variables.

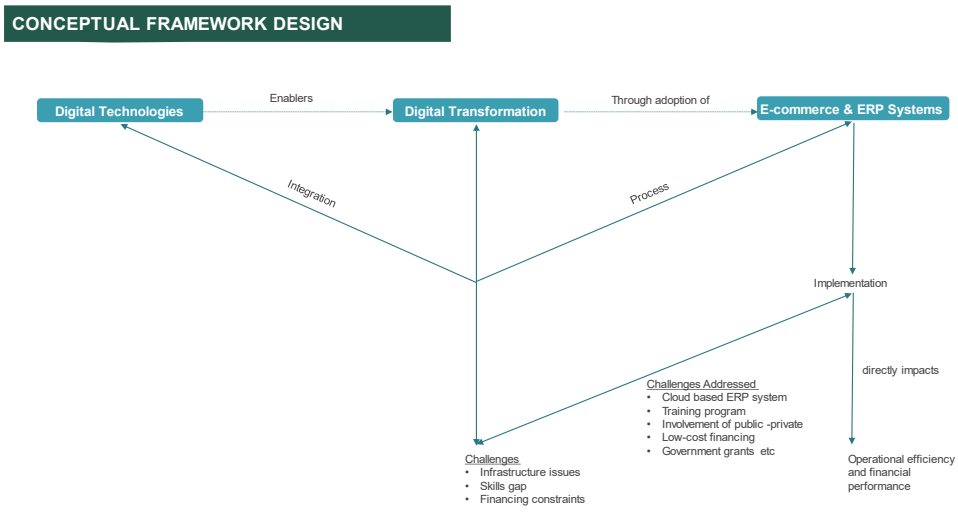

Figure 3.2: Conceptual Framework Design

Conceptual Links

Diagram 3.2 depicts the interplay between digital technology as an enabler, and the adoption of e-commerce and ERP systems, integrated to enable automation, data management, and connectivity that are critical for digital transformation.

Diagram 3.3 also shows how the integration of digital technologies (e-commerce and ERP systems) as key components of digital transformation collectively helps to enhance operational efficiency and financial performance, resulting from streamlining of business processes, wider customer reach, improved customer engagement and satisfaction, cost and error reduction, resource optimization, improved efficiency.

In addition, Figure 3.3 shows the conceptual framework for this study, which indicates how the unique challenges, such as skills gaps, infrastructure gaps, and financing constraints faced by the SMTEs in Lagos, Nigeria, can be addressed using measures, such as training programs to help bridge the skills gaps and cloud-based ERP systems to mitigate infrastructure limitations.

The study aims to provide a comprehensive analysis of the factors impacting digital transformation in the textile sector. This framework therefore provides a structured approach to understanding the interplay between digital technologies, digital transformation, and the adoption of e-commerce and ERP systems. Further, the study highlights how these elements collectively enhance operational efficiency and financial performance by addressing the unique challenges faced by SMTEs in Lagos Nigeria.

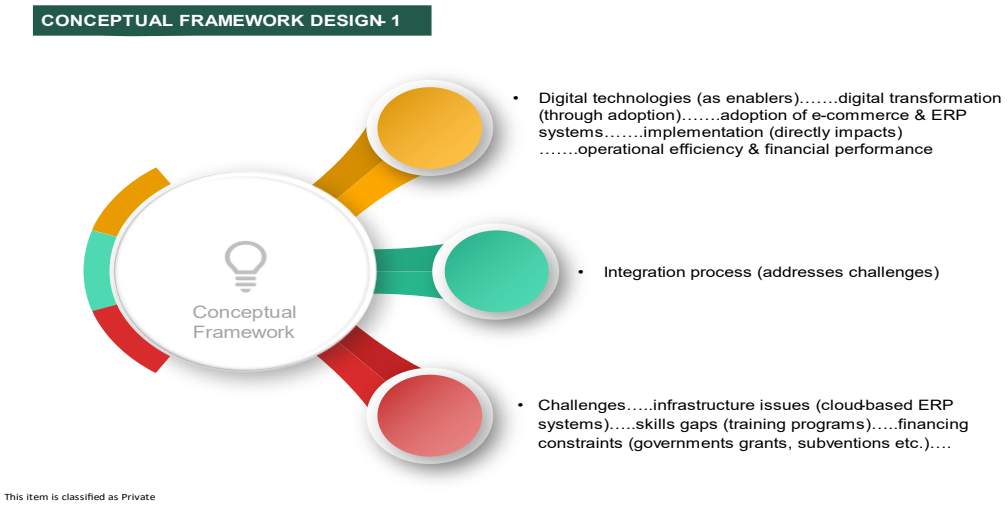

Figure 3.3: Conceptual Framework Design

Moreover, demographic variables were also constructed and significant in the data analysis and useful to ‘anticipate any mismatches concerning data collection procedures (Ewuzie et al., 2021) as depicted below table;

Figure 3.4 shows the demographic variables of the study population:

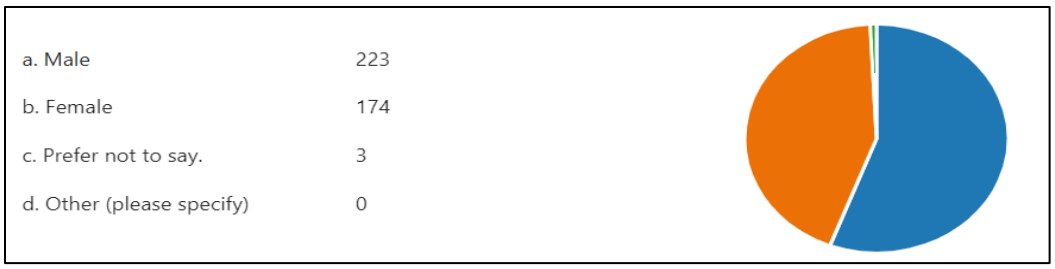

Figure 3.4: Gender

Meanwhile, the research fundamentally centers around the meticulous definition of variables, succinctly illustrated in the schematic diagram. The schematic encapsulates the relationships between the independent variables reflecting the adoption and implementation of digital technologies e-commerce and ERP systems and the dependent variables comprising operating efficiencies and financial performance.

Additionally, the response variables in this comprehensive framework were measured by the corporate performance indicators of gross profit margin, net profit margin, return on sales, and return on assets. These performance ratios serve as crucial metrics to gauge the impact of the independent variable on the operations of SMEs.

Beyond the intricate web of these digital and financial variables, the research incorporates demographic variables which include age of the respondents, gender (male or female), and title within the organization, were all a significant facet of the data analysis process. These demographic variables play a pivotal role in anticipating potential disparities in data collection procedures, ensuring a robust and contextually relevant approach to the research methodology (Ewuzie et al., 2021). The integration of these

demographic variables is visually represented in the accompanying table further elucidating their significance within the overarching research framework.

3.3 Research Purpose and Questions

The purpose of this research was to examine digital transformation in small and medium-sized textile enterprises (SMEs) in Lagos, Nigeria, assessing the adoption and implementation of digital technologies, specifically e-commerce and ERP systems, toward the firms' operating efficiencies and financial performance. The study, therefore, focused on the levels of adoption of digital technologies in Lagos, Nigeria, examined the impact and perceived benefits, including challenges and barriers of digital transformation, and how the implementation of digital technologies, specifically e-commerce and ERP systems, can impact and enhance the SMTEs operating efficiencies and financial performance. Particularly, the research questions from there are as follows:

1. To what extent have small and medium-sized textile enterprises (SMTEs) in Lagos Nigeria adopted e-commerce and ERP systems?
2. What are the key factors influencing the adoption of e-commerce and ERP systems in SMTEs in Lagos Nigeria?
3. How does the implementation of e-commerce and ERP systems impact the operational efficiency and financial performance of SMTEs in Lagos Nigeria?
4. What challenges are faced by SMTEs in Lagos Nigeria in implementing e-commerce and ERP systems and how can these challenges be mitigated?

3.4 Research Design

The design process flow for this research is as follows.

3.4.1 Research Philosophy

In this study, a mixed-method research approach is employed, drawing on both positivism and interpretivism. A pragmatic research philosophy is adopted, as positivism

allows for objective measurement of quantitative data, while interpretivism enables a deeper understanding of the qualitative aspects of digital transformation in the Nigerian textile industry. Positivism, characterized by an emphasis on objectivity and the systematic measurement of quantitative data, forms the element of this research philosophy. Positivist principles guide the rigorous quantitative analysis, facilitating the objective measurement of various aspects related to the adoption and implementation of digital technologies in SMTES. The quantitative data obtained enables the formulation of empirical insights and contributes to a comprehensive understanding of the quantitative aspects of digital transformation.

Concurrently, interpretivism is woven into the research philosophy to delve into the details inherent in the digital transformation landscape of the Nigerian textile Industry. Interpretivism provides a lens through which to explore the subjective and contextual elements of a subject, offering a deeper understanding of the intricate dynamics, challenges, and opportunities associated with the adoption and implementation of digital technologies in SMTEs. This qualitative exploration is vital for capturing rich contextual insights that may not be fully discernible through quantitative measures.

Moreso, pragmatic research philosophy is important in this study, acting as the overarching framework that harmonizes the positivist and interpretivism perspectives. Pragmatism embraces the practical application of research methodologies to effective and actionable outcomes. By acknowledging the value of both positivist and interpretivism approaches, pragmatism permits a flexible research design. This flexibility is instrumental in employing a blend of quantitative and qualitative methods that align with the research objectives, ensuring a holistic and insightful exploration of digital transformation in the Nigerian textile industry.

So for this study, the adoption of a mixed-method research philosophy, underpinned by elements of positivism, interpretivism, and pragmatism, reflects a deliberate and strategic approach to investigating the complex phenomenon of digital transformation in SMEs. This detailed philosophical foundation provides the research with the versatility needed to comprehensively address the research questions and contribute valuable insights to both academic scholarship and practical applications in the business landscape.

3.4.2 Research Approach

In terms of approach, a deductive approach was employed in that some literature already exists contributing to the body of knowledge, in addition to not attempting to develop a new brand of theories or separate form of segmentation analysis.

The research approach adopted is pragmatism, which combines elements of both positivism and interpretivism. This approach is suitable for a complex topic like digital transformation in a specific industry as it allows for flexibility in selecting the most appropriate methods for data collection and analysis.

Using a reductionist stance to investigate the research questions, a hypothetico-deductive research approach was adopted, which provided a scientific basis for answering the research questions by formulating theoretical questions and interlinking variables to deduce a certain outcome (Malhotra et al., 2007). So this framework hinges on dealing with pre-defined research questions and that results rigorously address the results of particular sets of circumstances, without exploring supplementary issues (Tengli, 2020).

Where no prior literature exists, an inductive approach can be chosen and here phenomena are observed and conclusions interpreted based on the information collected (Malhotra et al., 2007). However, a deductive approach was preferred for this study as some works of literature exist and make contributions to the existing body of knowledge

in the area of digital technology adoption by SMTEs in addition to not attempting to develop a new brand of theory or separate form of segmentation analysis.

Consequently, the research approach chosen for the study is a mixed method, that combines both quantitative and qualitative data collection and analysis to gain a comprehensive understanding of the digital transformation landscape of SMTEs in Lagos Nigeria.

3.4.3 Research strategy

This study made use of a survey research strategy for data collection, even though several different research strategies such as experiments, case studies, ground theory, ethnography, etc exist (Crossley, 2021). While surveys are useful for market segmentation, they can be characterized as a "structured questionnaire given to a sample of). population and designed to elicit specific information from respondents (Malhotra et al., 2007).

Fundamentally, the survey method aligned more with furthering the objectives of the study. While others such as case study, ethnography, and experimental could be considered alternatives, they have some limitations, such that experimental design, for instance, requires an intervention of some sort for the 'before' and 'effects to be measured (Malhotra et al., 2007) in addition to the fact that 'exogenous variables such as those effects thought not to influence causality are very difficult to isolate and eliminate from the research process (Rohrer & Murayama, 2023) so takes place in a laboratory or isolated settings'

Case Study significantly narrows the scope of the research by focusing on an umbrella grouping of special interests (Hollweck, 2015) even though it is often used in social science research to reflect a real-world context. The ethnographic method is also an option for this research study. The chosen research strategy follows a cross-sectional design, focusing on gathering data at a single point in time to assess the contemporary

landscape of digital transformation in SMTEs. This approach aligns seamlessly with the overarching objectives of the study, facilitating a comprehensive exploration of the current state of digital transformation within the identified sector.

Therefore, the adoption of a survey research strategy, aligns with the research objectives, allowing for a thorough exploration of the current state of digital transformation in SMTEs. This strategic choice acknowledges the limitations of alternative methods and prioritizes the comprehensive and varied data collection essential for the study's depth and breadth.

3.4.4 Time Horizon

The study adhered to a cross-sectional design, focusing on capturing the contemporary state of digital transformation within SMTEs in Lagos Nigeria. Data collection spanned a two-and-a-half month period, commencing from October 1st to December 20th, 2023. This timeframe facilitated a snapshot analysis of the current landscape of digital transformation initiatives within the targeted sector.

3.5 Population and Sample

The population of the study is SMTEs in Lagos, Nigeria. While largely an informal sector, the exact number of textile companies in Lagos is not available. However, the total number of SMEs of in Lagos State is stated at 11,643 (Ndiaye et al., 2018). While the SMTEs are included in the SMEs, for this study a sample size of 600 SMTEs was randomly selected for the survey to ensure statistical power and adequate representation. Stratified random sampling technique was deployed to ensure representation and good spread across Lagos.

The target population for this study is defined as those small and medium-sized textile enterprise (SMTEs) workers or owners in Lagos Nigeria. However and noting the large concentration of SMTEs in Lagos State, the survey questionnaire was administered

largely within the city of Lagos online to 600 SMTEs, selected through a stratified random sampling method, targeting enterprises that are incorporated within 10 years and susceptible to adopting digital technologies. The sample size was determined based on the availability of enterprises in the area and the resources available for data collection.

In addition to the online administration of the questionnaires was the use of a small team of two field workers familiar with the SMTEs in Lagos Nigeria. They moved around their offices explaining to them and on areas of further questions, to help them to understand and address any questions.

The questions were kept as comprehensive as possible to ensure maximum response participation and minimum interviewee fatigue (Malhotra et al., 2007). Consequently "scientific rigor was not to be compromised and scales were shortened if these did not compromise the integrity of the data collected (Condon et al., 2022).

3.6 Participant Selection

The participants in the survey were selected based on the following criteria;

1. Small and medium-sized textile enterprises (SMTEs) in Lagos Nigeria.
2. The SMTEs must be engaged in the production of and merchanding of textile products in Lagos Nigeria
3. The textile enterprise must have been in operation for at least one year and within 10 years of incorporation and are SMTEs that have adopted or are looking to adopt technologies
4. Owners and employees that have considerable experience in the textile industry

Participants in the interviews were selected based on the following criteria;

1. Policymakers, industry associations, and experts in digitalization and SME development in Nigeria

2. Participants with knowledge and experience in the sustainable growth of SMTEs in Nigeria and had indicated their intentions to participate in the survey questionnaires

The above participant considerations were based on the following justifications;

1. Noting the importance of gathering enough data to perform a credible and rigorous analysis, was utilized an average sample size of 600 (six hundred) SMTEs for the survey questionnaire administration and over 40 (forty) for the open-ended questions, meeting the threshold for a quantitative and also qualitative study of participants (Marshall et al., 2013).
2. To meet eligibility criteria and establish relationships with participants and those relevant in addressing the overarching research questions, as sample size and eligibility criteria could assist in understanding the problem and research question as an ideal and perfect case for the selected sample (Starr, 2014).
3. To aim at encouraging voluntary participation with the intent of using volunteers, informing them of the benefits of the research, networking, and maintaining confidentiality (Mealer & Jones, 2014; White et al., 2012), social media, networking, personal acquaintances, referrals, and professional colleagues and in line with (Mealer & Jones, 2014) the recommendation that recruitment of participants involves requesting participation with an email of study information, scheduling options, estimated length of interviews and informed consent.

3.7 Instrumentation

A survey questionnaire was developed for data collection using a common foundation, and to test the conceptual model in the form of a questionnaire (Burns et al., 2014). So a structured questionnaire was designed to collect quantitative data on the adoption, implementation, influence, impact, and challenges of using and implementing digital technologies and the dependent variables of operating efficiencies and financial

performance via various metrics as inccreased sales or sales figures, market size, customer engagement and satisfaction and sustainable financial growth. The survey questionnaire included both closed-ended (e.g. Likert Scale) and open-ended questionnaires structured around the following themes/sections.

1. Demographics such as gender, age, educational level, years of experience in the textile industry, job position/role, primary function
2. Digital transformation and adoption of digital technologies
3. Impact of digital technologies (e-commerce and ERP systems) adopted on sales and market size.
4. Impact of digital technologies on customer engagement and satisfaction
5. Digital transformation and its impact on sustainable financial growth
6. Strategy, opportunities, and challenges of digital transformation

The structure above and the questions were developed to collect data to address the research questions and hypothesis.

Consequently, the survey questionnaire consists of informed consent seeking participants' consent to proceed with the survey and then seven sections including demographic information, digital transformation and adoption of digital technologies, the impact of digital technologies on sales and market size, the impact of digital technologies on customer engagement, and satisfaction, digital transformation and its impact on sustainable financial growth, strategy, opportunities, and challenges of digital transformation and open-ended interview questions. All of the sections dealt with collecting information on the participants and also on the level of adoption and implementation of digital technologies such as e-commerce, ERP systems, or others by SMTEs and its impact on the identified metrics such increased sales, market size, customer engagement, and satisfaction, and sustainable financial growth to identify the operating

efficiences and financial performance. These were measured by certain key performance indicators such as gross profit/margin, net profit/margin, return on assets, return on sales, operating efficiency, revenue growth, cost reduction.

The format of the survey questionnaires was the use of Microsoft Forms to accommodate the ease of administering directly to the target populations (SMTEs) (Young, 2015) and responses from the participants and to accommodate various preferences as per the reasons enthused by Malhotra et al. (2007) such as 'quick response, relatively low costs, less time consuming for distribution, high rate of respondents, limited interview bias and a platform to create diverse and flexible questions'.

While some sections elicited responses of yes or no, most assumed the form of a Likert Scale as utilized by Tanujaya et al., 2022, in addition to using a multi-item scale such as the 7-point Likert Scale. The essence is to solicit responses from the survey by specific measurement scales such as those espoused in the 'Marketing Scales Handbook' (Bruner, 2013).

3.7.1 Questionnaire Design

The survey questionnaire was structured to gather quantitative data about the research topic, focusing on the adoption impact of digital technologies within SMTEs. The questionnaire encompassed both closed-ended Likert scale questions and open-ended inquiries catering to a diverse range of perspectives. The electronic format of the questionnaire, administered via Microsoft Forms, facilitated seamless online data collection, augmented by the involvement of field officers to ensure comprehensive coverage (Peter C. Verhoef, Thijs Broekhuizen, Yakov Bart, Abhi Bhattacharya, John Qi Dong, Nicolai Fabian, 2021).

3.7.2 Questionnaire Structure

The survey commenced with a section on informed consent, where respondents were requested to provide their consent before proceeding with the questionnaire. Subsequent sections of the questionnaire delved into demographic information, digital transformation initiatives, impact assessment of digital technologies on various business facets, and strategic considerations. Carefully constructed Likert scale questions were employed to gauge respondents' perceptions and levels of agreement, ensuring clarity and mitigating bias in data collection.

Therefore, the research choices adopted in this study reflect a robust and comprehensive approach aimed at garnering rich insights into the adoption and impact of digital technologies within the textile industry in Lagos while also ensuring the methodological rigor and validity of findings

3.8 Data Collection Procedures

Quantitative data – for the quantitative data, a structured survey questionnaire was designed using Microsoft Forms and administered online to a random sample of 400 SMTEs in Lagos, Nigeria. The structured survey is designed to gather information/responses amongst others on the following.

- Adoption rates of e-commerce and ERP systems (binary: Yes/No)
- Cost (Measured in monetary terms and perceived affordability)
- Technical Expertise (measured on a Likert scale)
- Perceived Benefits (measured on a Likert scale)
- Operational Efficiency (KPIs like inventory turnover, order processing time)
- Financial performance (revenue growth, profit margins, ROI)
- Implementation challenges

Qualitative data – as part of the Microsoft form questionnaire, qualitative data collection was semi-structured interview questions administered to a subset of the survey participants to gain deeper understanding and insights into the following;

- Detailed experiences with adoption and implementation
- Specific challenges and mitigation strategies
- Perceived impact on business operations and financial performance

So, the data collection for this research was carried out scientifically due to the importance of the methodology and the advanced statistical techniques used to analyze the data. The sampling process stages (Malhotra et al., 2007:267) are as detailed below.

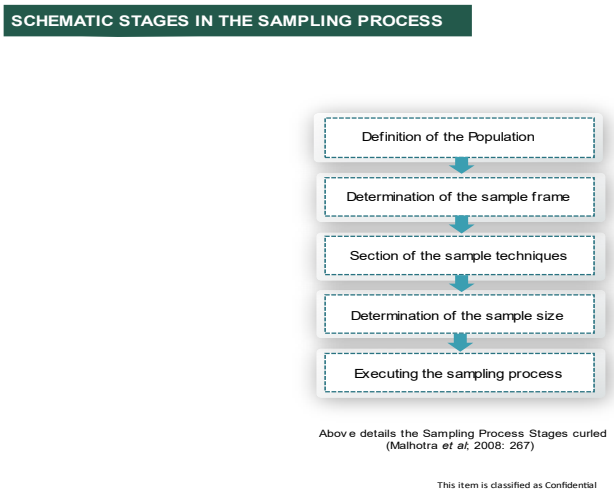

Figure 3.5: Sampling Process Schematic Stages

The quantitative data collection was conducted with scientific rigor, recognizing the importance of robust methodology in alignment with the advanced statistical techniques integral to the subsequent data analysis. The Likert scale style, known for its precision and ability to quantify respondents' perceptions was employed. The administration of the quantitative data was primarily executed online through Microsoft Forms. Additionally, two field workers were engaged, undertaking visits to numerous SMTEs in Lagos Nigeria.

These field workers played a crucial role in facilitating discussions, addressing queries, and ensuring a comprehensive understanding among the participants.

For the qualitative component, responses to the open-ended questions were gathered through a combination of in-person interactions and post-survey follow-ups. The open-ended questions were strategically embedded within the survey questionnaires, enabling participants to provide detailed insights and narratives related to the research objectives. This dual approach ensured a holistic and detailed understanding of the qualitative aspects surrounding the adoption and impact of digital technologies within the targeted SMTEs.

The data collection procedure characterized by a blend of online surveys, field interactions, and thoughtful inclusion of questions, reflects a meticulous and scientific approach.

The incorporation of both quantitative and qualitative data collection methods enriches the research findings, providing a comprehensive understanding of the digital transformation landscape within the textile industry in Lagos Nigeria.

The data collection process for this research was meticulously executed, acknowledging the significance of the methodology and the sophisticated statistical techniques employed for subsequent analysis. The phase of the data collection spanned two and a half months, commencing from October 1st to December 20^{th,} 2023.

3.9 Data Analysis

In the pursuit of a rigorous examination of the research data, this study leverages the Statistical Package for the Social Sciences (SPSS), a software manufactured by IBM. SPSS is renowned for its versatility, enabling the analysis of a diverse array of tasks ranging from descriptive statistics to the execution of multivariate statistical techniques grounded

in probability theory. The primary objective is to conduct a comprehensive analysis and present the findings in various formats including tables and graphs.

3.9.1 Techniques and Software's

For the data analysis, the Cronbach Alpha co-efficient (Cooper, 2008) was used to achieve scale purification and that was by testing the item reliability and so fit for use in academic research projects in addition to utilizing confirmatory factor analysis to assess construct validity (Cooper, 2008). If the 'reliability and validity of scales are in order, the results from the data analysis may reasonably be considered robust and credible' (Ursachi et al., 2015).

To ensure the reliability and validity of the scales employed in this study, Cronbach's Alpha coefficient, as advocated by Cooper, 2008 was utilized. This involved an intricate process of scale purification, scrutinizing the item reliability to ascertain their suitability for deployment in academic research projects.

In addition, Confirmatory Factor analysis (CFA), another vital technique endorsed by Cooper, 2008 was employed to assess the construct validity, Strauss and Smith (2009) a way to measure how well the assessment tool measure what it is intended to assessed through hypotheses testing. This is important to operationalize the constructs into concrete and measurable characteristics This methodological approach strengthened the credibility of the research findings by rigorously evaluating the underlying structure of the constructs.

The significance of this statistical analysis lies in its capacity to enhance the robustness and credibility of the results. As Abbas, 2024 aptly notes, when the reliability and validity of scales are meticulously addressed, the outcomes derived from the data analysis attain a level of credibility that renders them suitable for scholarly consideration.

So, the meticulous application of these statistical techniques, anchored in established methodologies, underscores the commitment to ensuring the soundness and integrity of the research findings.

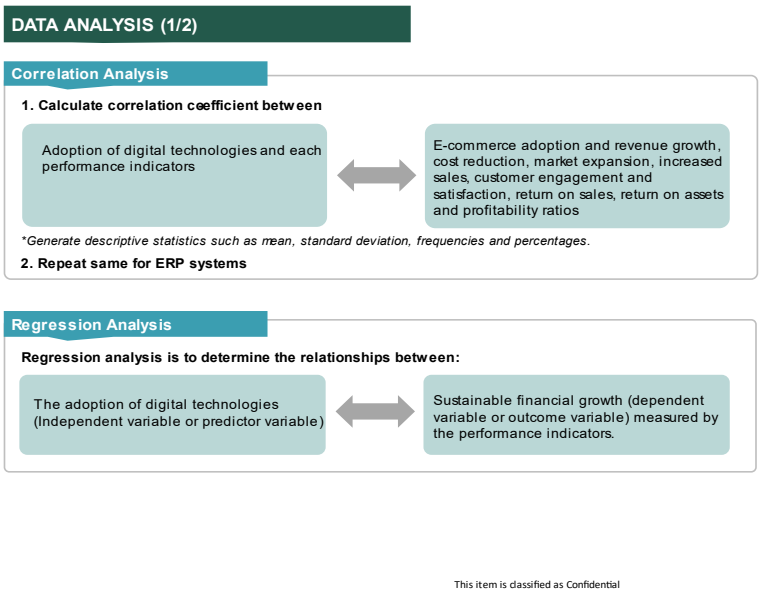

Figure 3.6: Data Analysis (1/2)

3.9.2 Descriptive Statistical Analysis

To analyze how the respondents rated a particular attribute in the questionnaire, descriptive statistics reflecting the demographic characteristics of respondents was utilized in dealing with descriptive statistics such as mean, standard deviation, and minimum and maximum values relating and attributable to each variable or construct.

Further was the use of ANOVA (Analysis of Variance) to determine whether a fundamental difference exists between the mean values of various cohorts. Therefore was the use of normalized data and data that does not adhere to criterion subjected to non-parametric equivalent, the Kruskal Wallis test (Black, 2013; Hair et al., 2010), the unit of analysis being the adoption of digital technologies and unit of description relating to the demographic composition of the respondents such as gender, age, educational qualification, etc.

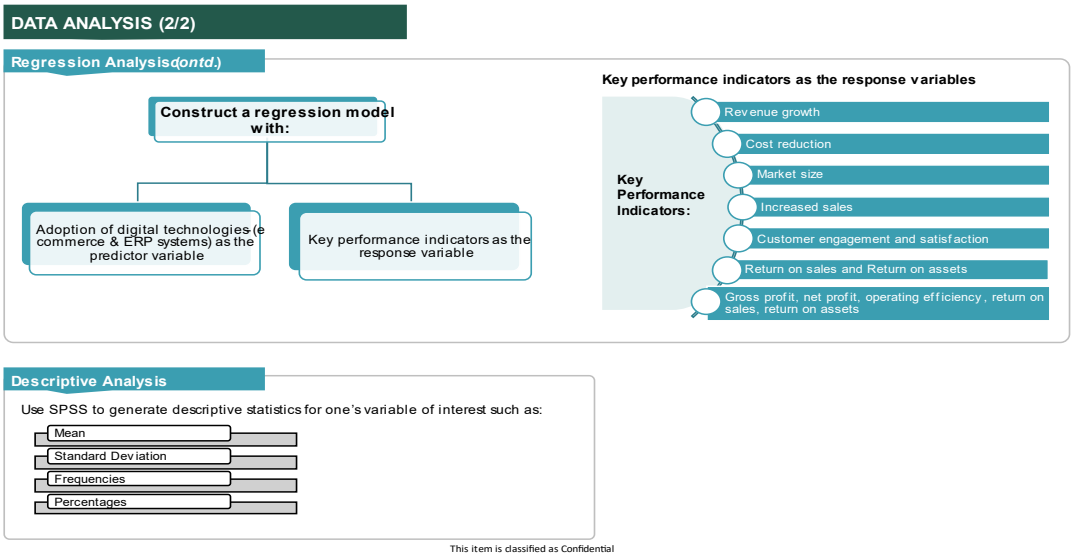

Figure 3.7: Data Analysis (2/2)

3.9.3 Correlation Analysis

The researcher used a statistical software, SPSS to perform the correlation analysis and to generate descriptive statistics such as means, standard deviations, frequencies, and percentages for one's variables of interest. Therefore, correlation Analysis was used to calculate the correlation coefficients between the adoption and implementation of digital technologies and SMTEs operating efficiencies and financial performance. assessed using such metrics as increased sales, market size expansion, customer engagement and satisfaction, and sustainable financial growth and measured by some key performance indicators such as revenue growth, cost reduction, operating efficiency, return on assets, and return on sales.

These provided an overview of the data and helped with the understanding of the characteristics of the sample, by determining the significance of the correlations using statistical tests of p-values to interpret the strength of the correlation based on the magnitude of the coefficient (e.g., weak, moderate, strong).

3.9.4 Regression Analysis

The regression model helps in determining in detail the relationship between adoption of digital technology and financial growth and determining the significance of each predictor variable. The same statistical software (SPSS) as mentioned earlier was used to perform the regression analysis and access the relationship between the predictor and outcome variables, in addition to assessing the indicator of the regression coefficients using statistical tests of such as t-tests or p-values, and additionally evaluating the goodness-of-fit of the regression model using R-squared metrics.

Moreover, the Chi-square Test was used by the researcher to test for association and to determine whether there is a statistically significant relationship between two categorical variables such as (adoption of digital technologies and increased sales, market size or (adoption of digital technologies and customer engagement and satisfaction) or (adoption of digital technologies and customer engagement and sustainable financial growth).

In addition, the researcher used SPSS to create graphs and charts (bar charts, scatter plots, and other types of charts) to visualize one's data and analysis results.

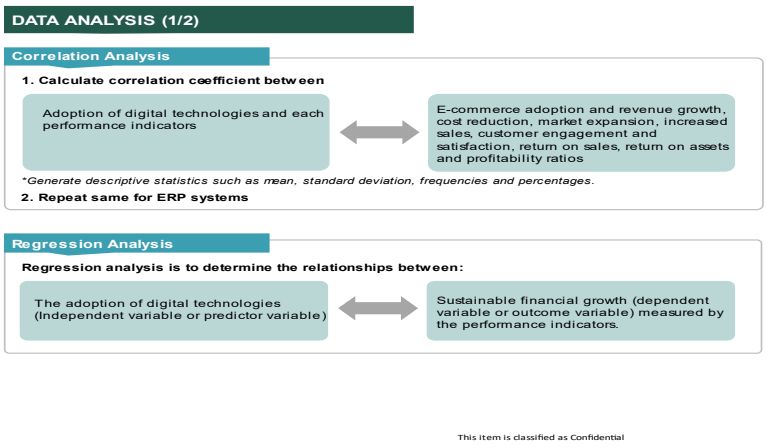

Figure 3.8: Statistical Analysis

3.9.5 Reliability and Transferability

To determine reliability, the development and structuring of the research instrument comprising the various questions and validity maintained through inviting experts in both the academic and the business industries were deployed.

For transferability, probability sampling was used to generate a representation across the geographic areas, including the large sample size, which allowed the results to be generalized beyond the sample area.

3.10 Research Design Limitations

The researcher looked at the limitations of the chosen methodology and research design including factors drawn from the research method that might affect the reliability or validity of the conclusions (J. Ellis & Levy, 2010). Further, the researcher notes that 6 (six) sources of data are available, each with limitations such as observations, documents, archival records, open-ended interviews, structured interviews with surveys, or focused interviews (Yin, 2014) and that each source has limitations that could negatively impact the reliability and validity of the study such as limited to quantitative data or not accessible to the public (Yin, 2014). Though advised that using interview questions increases truthfulness and dependability of the results and therefore avoids over-accumulation of irrelevant data. The recommendation was the use of an explicit process by the researcher to minimize research limitations on reliability and validity.

One of the limitations of this study is the potential response bias, as some participants within the SMTEs were not willing to participate in the study. Another limitation is the potential for measurement bias, as the survey questionnaire may not have captured all the relevant variables that influence the adoption and implementation of digital technologies such as e-commerce, ERP systems, or others by SMTEs in Lagos Nigeria.

Another limitation of this study is the small sample size of 600 SMTEs, which may not be representative of all small and medium-sized textile enterprises in Lagos Nigeria. Moreso, the study focused only on the textile industry, and the findings may not be generalizable to other industries. Finally, the study might rely on self-reported data, which may be subject to bias.

3.11 Ethical Considerations

For this research, the researcher ensured ethical considerations were paramount while informing the participants that participation is voluntary and therefore have the right to withdraw at any time without penalty, the respondents' consents were obtained (informed consents) from potential research participants (Manti & Licari, 2018) to participate in the survey. Seeking voluntary informed consent involved the process requiring the researcher to disclose fully to prospective participants for the study the potential risks and benefits arising from their participation, the nature of their involvement and without undue influence allowing them to participate in the survey. Consequently, the process of seeking informed consent by the researcher, including full disclosure of relevant information to the participants, ascertaining their decision-making capability, and willingly signing the consent form satisfies a minimum ethical consideration for research. The whole essence of seeking informed consent protects the human rights of vulnerable participants, including the right to respect, knowledge of the relevant information, confidentiality, and privacy; cautioned against implementing informed consent as a one-off form-signing activity to satisfy the approval requirements of the institution.

Therefore, the consent form was part of the document to be completed by the participants, and this was made available to them prior to their responses to the questionnaires. This is also to create an environment of trust between the researcher and the participants so by encouraging them to participate in the research process voluntarily

and to also withdraw voluntarily with no repercussions if they choose to do so. There were no monetary incentives to unduly influence or impair participants' objectivity as these would blur the research itself. Consequently, confidentiality and privacy were observed as these are key ethical requirements, so implemented to disguise the participant's identities, protect their privacies and any adverse individual and professional consequences that might arise from their participation (Singer & Couper, 2008) ensuring that responses are anonymized, data are securely stored according to Microsoft article security and privacy in Microsoft formats as the software is compliant with HIPAA and BAA protection standards. The data is encrypted at rest and in transit.

3.12 Conclusion

The research design and methodology for this study detail the sequential steps for data collection, applicability, and structural integrity of the proposed conceptual model. The design of the survey questionnaires, its administration, and various measurement scales was employed to scientifically test the responses from a sample size of 400 respondents, including the discussions around statistical tools and the analysis deployed. The data collected was analyzed using descriptive and inferential statistics including the use of Cronbach SPSS for data reliability.

Quantitative data was analyzed using descriptive statistics of mean and standard deviation to describe the various levels of these variables/metrics and inferential statistics of correlation and regression analysis to explore the relationship between the level of adoption and implementation of digital technologies, specifically e-commerce and ERP systems,, and the SMTEs' operating efficiencies and financial performance. While, qualitative data was analyzed using thematic analysis to explore the broader environmental, social, economic, government policies and regulations, and political implications of digitalization in SMTEs in Lagos Nigeria.

These were data from participants who responded to the open-ended questions, and were those willing to provide more responses as they sought to improve their business processes towards operating efficiencies and financial performance as well as other business objectives including sales growth, market share, and general international business with the understanding that international entrepreneurship orientation reflects the firm's overall innovativeness and proactiveness in the pursuit of international markets associated with innovativeness, managerial vision, and proactive competitive posture

This study therefore offers valuable insights into the levels of adoption and implementation of digital technologies, specifically e-commerce and ERP systems by small and medium-sized textile enterprises (SMTEs), and their impact on operational efficiences and financial performance.

It is expected that the findings of this study will contribute significantly to the existing body of knowledge by shedding light on the extent of adoption and its influence, while also offering practical implications for SMTE owners, employees, and policymakers. These implications are expected to positively influence business practices and have broader implications for social change, entrepreneurship, and strategic management, ultimately benefiting society as a whole.

CHAPTER IV:

RESULTS

4.1 Introduction

The primary objective of this study on digital transformation by SMTEs was to evaluate the extent to which they have adopted and implemented digital technologies, specifically e-commerce and Enterprise Resource Planning (ERP) systems, in addition to analyzing the impact of the adoption and implementation on the SMTEs' operating efficiencies and financial performance.

The examination of data collected from a survey of 400 SMTEs of the 600 participants constitutes the focal point of this analysis. Specifically, the investigation centers on discerning the relationship between the independent variables – comprising the adoption and implementation of digital technologies – and the dependent variables, which are operating efficiencies and financial performance. These dependent variables are gauged through key financial indicators such as increased sales, market size expansion, customer engagement and satisfaction and sustainable financial growth measured by key performance indicators of gross profit, net profit, return on assets (ROA), and return on sales (ROS). This study, rooted in these principles, seeks to unravel the interplay between these variables (independent and dependent) as detailed in the below figure:

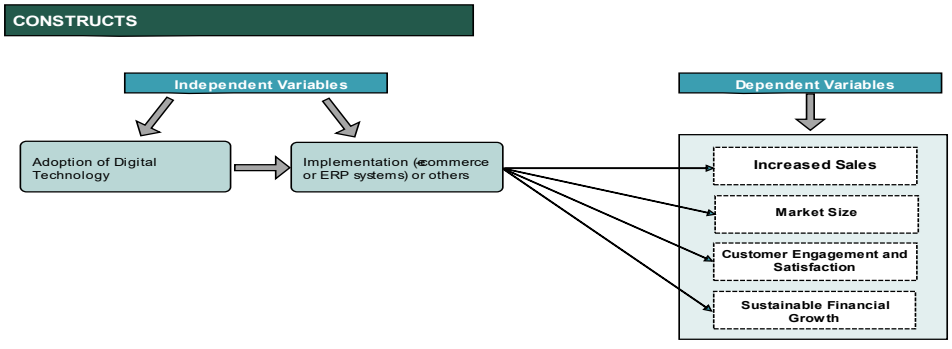

Figure 4.1: Conceptual Framework

Therefore, in this chapter, the core model which is the adoption and implementation of digital technologies specifically e-commerce and ERP systems by SMTEs, and its dependent variables which are operating efficiencies and financial performance were presented for empirical testing and as per the holistic conceptual model as detailed in the literature review and following the below-derived objectives.

4.2 Data Analysis Techniques

For data analysis, the SPSS tool was used for the analysis. Regarding the thematic analysis, coding, and categorizing interview data were used to identify common themes and patterns related to factors affecting adoption (costs, technical expertise/skills, perceived benefits and challenges (infrastructural limitations, high investment costs, lack of or insufficient skills).

For the quantitative data, validity was ensured through content validity using expert reviews, and construct validity was ensured through factor analysis. Moreso, reliability was ensured through pilot testing of the survey instruments in addition to using Cronbach's alpha to measure the internal consistency.

For the qualitative data, and regarding transferability, detailed descriptions of research context to allow comparisons with other settings were employed and credibility was ensured through comparing survey and interview data (triangulation) and verifying findings with participants (member checking).

Further to the above, on quantitative analysis, descriptive statistics to summarize the data (mean, median, and standard deviation) were employed resulting in the below results;

For digital technology adoption: mean – 3.57; standard deviation = 4.28

Reliability, using Cronbach's alpha = 0.886

Correlation analysis was used to determine the relationship between variables, costs and adoption rate.

Multiple regression analysis was used to test the impact of the adoption of e-commerce and ERP systems being the independent variables. In addition to using the tools to analyze costs, technical expertise, perceived benefits and their impact on the dependent variables (operational efficiency and financial performance)

4.2.1 Regression models

Each of the dependent variables, operating efficiencies and financial models are detailed separately below, showing these and the formula employed.

Model 1:

Operational efficiency = $\beta 0 + \beta 1$ (e-commerce adoption) + $\beta 2$ (ERP system adoption) + $\beta 3$ (Cost) + $\beta 4$ (Technical expertise) + $\beta 5$ (Perceived benefits) + E

Model 2:

Financial Performance = $\beta 0 + \beta 1$ (e-commerce adoption) + $\beta 2$ (ERP system adoption) + $\beta 3$ (Cost) + $\beta 4$ (Technical expertise) + $\beta 5$ (Perceived benefits) + E

Note: β = Beta

4.2.2 Regression Analysis

Regression analysis was employed in assessing the impact of e-commerce and ERP systems on operational efficiency and financial performance.

The following multiple regression was used to predict the value of dependent variables (financial performance) based on independent variables (adoption and implementation e-commerce, ERP systems, costs, technical expertise)

Model 1

- Operating efficiency as the dependent variable
- Adoption of e-commerce and ERP systems as the independent variables.

The results of the analysis are as stated below.

- **R2 = 0.60; F-statistic:** 12.32 ($p<0.001$);
- **Coefficients**
- **Adoption of e-commerce:** (Beta) = 0.30, $p<0.01$
- **Adoption of ERP systems:** (Beta) = 0.35, $p<0.01$
- **Cost:** (Beta) = -0.25, $p<0.05$
- **Technical expertise:** (Beta) = 0.25, $p<0.01$
- **Perceived benefits:** (Beta) = 0.26, $p<0.05$

Model 2

- Financial performance as the dependent variable
- Adoption of e-commerce (binary) and ERP systems (binary) as the independent variables

The results of the analysis are as stated below.

- **R2 = 0.68; F-statistics:** 15.63 ($p<0.001$);
- **Coefficients**
- **Adoption of e-commerce:** (Beta) = 0.35, $p<0.01$
- **Adoption of ERP systems:** (Beta) = 0.40, $p<0.01$
- **Cost:** (Beta) = -0.25, $p<0.05$
- **Technical expertise:** (Beta) = 0.30, $p<0.01$
- **Perceived benefits:** (Beta) = 0.28, $p<0.05$

On regression analysis, the interpretation is as follows.

1. That both adoption of e-commerce and ERP systems have a significant positive impact on operational efficiency and financial performance
2. That higher costs negatively impact both operational efficiency and financial performance

3. That technical expertise and perceived benefits positively influence both operational efficiency and financial performance.

4.2.3 Correlation Analysis

The purpose was to examine the relationship between adoption rates and factors like cost, technical expertise, and perceived benefits.

Pearson correlation coefficient was used to measure the strength and direction of the relationships between two variables; The result is detailed as follows.

- The correlation between costs and adoption rate was -0.40 ($p<0.01$)
- The correlation between technical expertise and adoption rate was 0.55 ($p<0.01$)
- The correlation between perceived benefits and adoption rate was 0.50 ($p<0.01$)

The interpretation therefore shows that.

1. There is a moderate negative correlation between cost and adoption rate, indicating higher costs are associated with lower adoption
2. There is a strong positive correlation between technical expertise and adoption rate, suggesting higher technical expertise is associated with higher adoption
3. There is a moderate positive correlation between perceived benefits and adoption rate

Further to the above analysis, from the correlation and regression analysis done, it could be seen that:

Adoption of e-commerce and ERP systems with key factors such as cost, technical expertise, and perceived benefits playing great roles have a significant contribution to the improvement of SMTEs' operational efficiencies and financial performance.

While technical expertise and perceived benefits have positive influences, higher costs have some negative impacts. These challenges include skills gaps, and technical

infrastructure limitations that have to be addressed through targeted training and financial incentives from the regulators and government.

The data indicates that out of 400 respondents, 379 (94.8%) own or work in a textile enterprise, while only 21 (5.3%) do not. This demonstrates that the vast majority of the participants are directly involved in the textile industry.

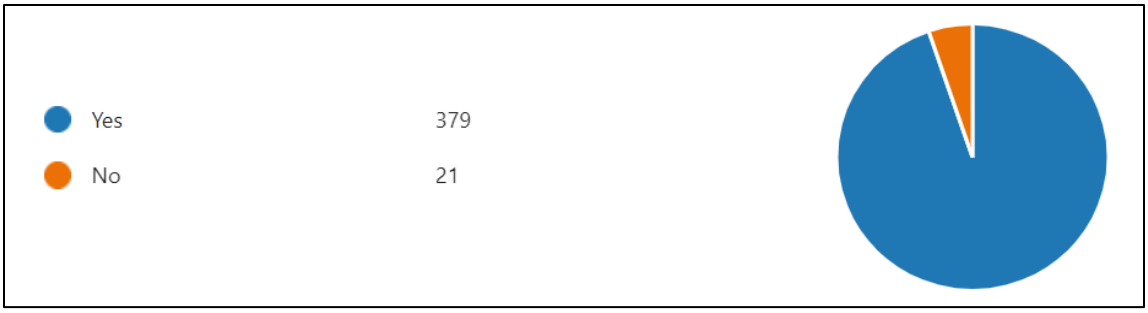

Figure 4.2: Do you own or work in a Textile enterprise?

While the 84.5% are sole proprietorships, 12.75% are partnerships.

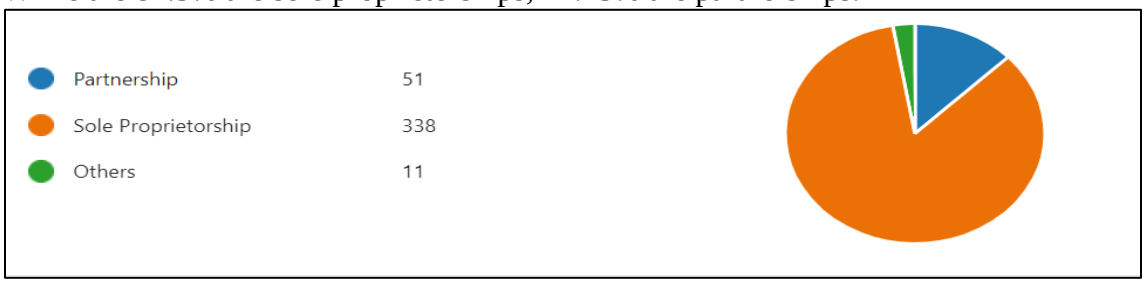

Figure 4.3: Enterprise Legal Status

Validity and Reliability Scales

Table 4.1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
On a scale from 1-5, please rate the contribution	386	1	5	3.41	1.429	2.041	-.375	.124	-1.265	.248

of government policies/incentives to adoption of digital technology.2										
On a scale from 1-5, please rate personalized digital technology adoption and implementation on their impact on customer engagement and satisfaction.	386	1	5	3.42	1.396	1.948	-.375	.124	-1.203	.248
On a scale from 1-5, please rate the contribution of government policies/incentives to expanding the firm's market size Geographic expansion.	386	1	5	3.75	1.145	1.311	-.655	.124	-.527	.248
On a scale from 1-5, please rate partnership and collaboration on their impact on customer engagement and satisfaction.	386	1	5	3.88	.994	.988	-.747	.124	.162	.248

On a scale from 1-5, please rate customer survey and feedback implementation on their impact on customer engagement and satisfaction.	386	1	5	3.93	1.004	1.008	-.824	.124	.290	.248
On a scale from 1-5, please rate clear communication on their impact on customer engagement and satisfaction.	386	1	5	4.05	.880	.774	-.671	.124	.063	.248
On a scale from 1-5, please rate excellence customer service on their impact on customer engagement and satisfaction.	386	2	5	4.05	.833	.693	-.613	.124	-.171	.248
On a scale from 1-5, please rate the following factors on their contribution to sustainable financial growth Effective financial management	386	1	5	4.06	.887	.786	-.763	.124	.341	.248

On a scale from 1 – 5, please rate the contribution of cultural considerations to increased sales.	386	1	5	4.08	.854	.729	-.860	.124	.803	.248
On a scale from 1-5, please rate the contribution of strategic partnership to expanding the firm's market size Geographic expansion.	386	1	5	4.09	.845	.713	-1.036	.124	1.730	.248
On a scale from 1 – 5, please rate the contribution of innovation to increased sales.	386	1	5	4.10	.868	.753	-.873	.124	.690	.248
On a scale from 1 – 5, please rate the contribution of customer service to increased sales.	386	1	5	4.12	.868	.753	-1.058	.124	1.294	.248
On a scale from 1 – 5, please rate the contribution of sales team performance to increased sales.	386	1	5	4.15	.828	.686	-1.119	.124	1.694	.248

On a scale from 1 – 5, please rate the contribution of product quality to increased sales.	386	1	5	4.17	.885	.783	-.980	.124	.828	.248
On a scale from 1-5, please rate the contribution of innovation to expanding the firm's market size Geographic expansion.	386	1	5	4.21	.790	.623	-1.091	.124	1.902	.248
Valid N (listwise)	386									
a. $bootstrap_split = 1										

While there are varying degrees of negative skewness including fluctuating levels of Kurtosis, to obtain definitive results for testing the status of normality of data within the sample, advanced tests was employed (Beneke, J.H, 2014) by using the Kolmogorov-Smirnov and Shapiro-Wilk tests. The following hypotheses were developed to ascertain whether the distribution was significantly normalized or not.

Hypothesis 1-

- **Null Hypothesis -** A significant proportion of SMTEs in Lagos Nigeria have not fully adopted e-commerce and ERP systems.
- **Alternate Hypothesis -** A significant propoertion of SMTEs in Lagos Nigeria have fully adopted e-commerce and ERP systems.

Hypothesis 2 –

- **Null Hypothesis -** The implementation of e-commerce and ERP systems does not positively impact the operational efficiency and financial performance of SMTEs in Lagos Nigeria.

- **Alternate Hypothesis -** The implementation of e-commerce and ERP systems positively impacts the operational efficiency and financial performance of SMTEs in Lagos Nigeria.

Hi – the data shows a positive impact

Ho – the data does not show a positive impact

Table 4.2: Normality Statistics

	Kolmogorov-Smirnov			**Shapiro-Wilk**		
#	Statistics	Degree of Freedom	Significance	Statistics	Degree of Freedom	Significance
Hypothesis 1	.191	482	.000	-893	482	.000
Hypothesis 2	.189	482	.000	-876	482	.000

@ Lilliefors Significance Correction

At the 5% significance level for the various scale items, the conclusion therefrom is that the data is NOT normally distributed across the board and the NULL hypotheses can be safely rejected using the non-parametric tests for all inferential purposes (Pallant, 2013).

4.2.4 Conceptual model and embedded hypotheses

For the embedded hypotheses, showing the entire set of relationships hypothesized in the literature synthesis and its testing, the SPSS Statistics data editor was used for the analysis, using the compare means and proportion menu and the one-sample t-test. These are detailed under statistics analysis. Moreover, linear regression analysis was also used for the testing of the hypotheses.

Validity and reliability Scales

The confirmatory factor analysis is conducted to assess the validity of the model (Hair et al., 2010) and the value should exceed 0.7 for an item to successfully load onto a construct (Hair et al., 2010)and to be deemed fit forusage in the ensuing statistical analysis.

Item total Reliability

Conducting an item total reliability analysis of the constructs by measuring the internal consistency and reliability of the model (Beneke, J.H. 2014), using Cronbach Alpha's for each construct. So Cronbach Alpha's value should exceed 0.6 preferably 0.7 (Malhotra et al, 2008; Burgers & Steenkamp, 2006).

Table 4.3: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.886	.903	10

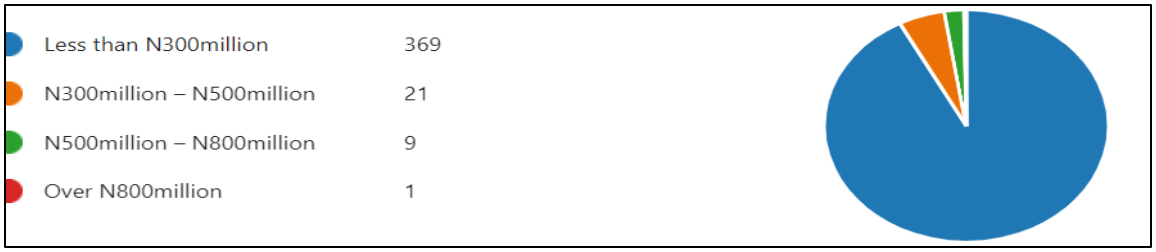

Figure 4.4: What is the firm's annual revenue (Approx.)

On the firm's annual revenue, over 92.25 are within the less than N300million bracket.

Section 1 - Demographics

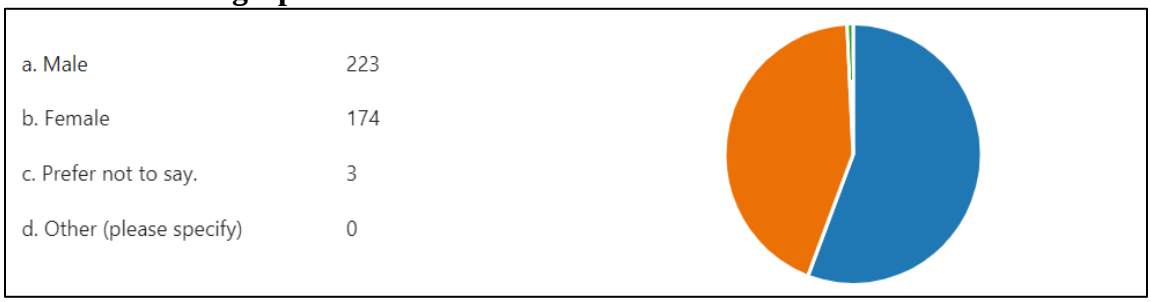

Figure 4.5: Gender

The demographic data indicating the gender distribution among the surveyed participants provides insights into the composition of the sample population for the study. Most of the respondents, constituting 55.8% identified as male. This indicates a higher representation of participants in this study. The prevalence of respondents may reflect the gender distribution within the textile industry or a bias in the sampling process. While approximately 43.5% of the participants identified as female. While this percentage is slightly lower than the male respondents, it still represents a substantial proportion of the sample. The inclusion of female perspectives is crucial for ensuring a comprehensive understanding of the industry dynamics. A small percentage comprising 0.8% chose not to discuss their gender. This choice may reflect individual privacy preferences and underscores the importance of providing participants with the option to withhold certain demographic information. Providing participants with options for disclosure aligns with ethical considerations in data collection. So, the study's gender distribution highlights the importance of promoting diversity and inclusion Recognizing and incorporating diverse perspectives, including those of both genders, contributes to a more robust and representative understanding of the challenges and opportunities within the textile industry.

Table 4.4: How important do you think digital transformation is for the growth and sustainability of small and medium-sized textile enterprises in Nigeria?

	Frequency	**Percent**
Extremely important	38	9.5
Not important	124	31.0
Not very important	28	7.0
Very important	210	52.5
Total	400	100.0

Section 2: Adoption of Digital Technologies

On the adoption of digital tools such as e-commerce, data received suggests that only 46.5% have adopted e-commerce to a great extent, while 43.5% have not, or just to a small extent, adopted e-commerce for their businesses. While a significant portion representing 46.5%% of the surveyed SMTEs have adopted and implemented e-commerce to a great extent, this group has a proactive approach to digital transformation, embracing technologies to enhance the various aspects of their business operations including online sales, data management, and process efficiency. A substantial percentage comprising 43.5% of the respondents either have not adopted digital tools or have done so to a small extent. This segment indicates a notable portion of SMTEs that may still be in the early stages of digital adoption or may face challenges hindering their ability to fully embrace e-commerce. So, the disparity in adoption levels suggests a digital divide within the textile industry with some enterprises proactively leveraging digital tools, while others lag. Therefore, understanding these barriers, whether they are related to financial constraints, lack of awareness, or technological hesitancy, is essential in developing targeted strategies to overcome them.

Table 4.5: To what extent has your textile enterprise adopted e-commerce?

	Frequency	**Percent**
Not at all	120	30.0
To a great extent	186	46.5
To a small extent	54	13.5
To a very great extent	40	10.0
Total	400	100.0

For ERP systems 44% have adopted the same to a great extent and 46.5% have not or just to a small extent adopted ERP system. So, for ERP systems, a business management tool, approximately 44% of the surveyed SMTEs have largely adopted the same. This indicates a substantial number of enterprises that have recognized the value and utility of

ERP systems in streamlining their operations, managing resources efficiently, and improving overall organizational efficiency. Conversely, 46.5% of the respondents either have not or have done so to a small extent. This segment suggests a significant proportion of SMTEs that may not have fully embraced the comprehensive functionalities offered by ERP systems or may face barriers hindering their complete integration. So, there may be a need for increased education and awareness within the sector, highlighting the transformative impact of ERP systems and addressing common misconceptions.

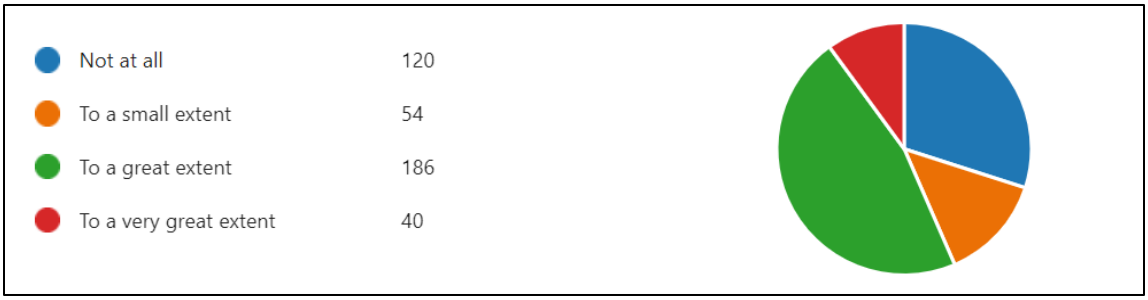

Figure 4.6: To what extent has your textile enterprise adopted e-commerce?

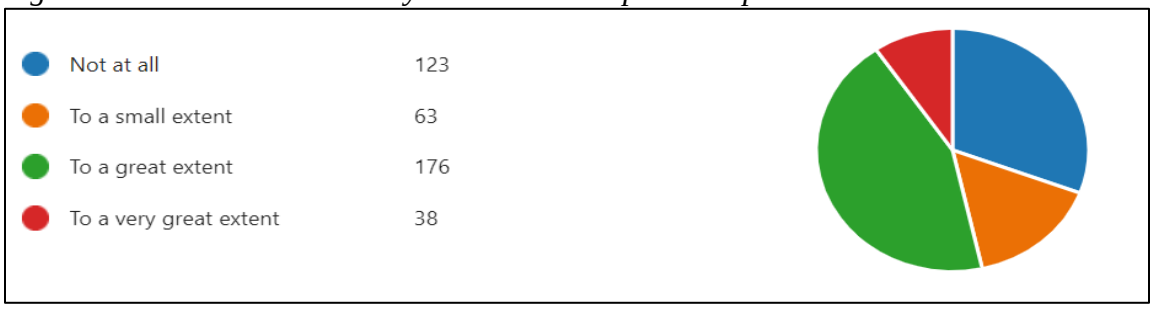

Figure 4.7: To what extent has your textile enterprise adopted ERP systems?

Table 4.6: To what extent has your textile enterprise adopted internal collaborative communication tools (Teams/Slack/Trello/Others)?

	Frequency	Percent
Not at all	127	31.8
To a great extent	178	44.5
To a small extent	58	14.5
To a very great extent	37	9.3
Total	400	100.0

As to the level of implementation of digital technologies, only 44.5% of the respondents advised and agreed that they have invested in modern technologies to enhance their operations. Most of the respondents advised that digital transformation is for the growth and sustainability of SMTEs and see this as very important, while 37 (15.88%) as extremely important. This is as detailed below.

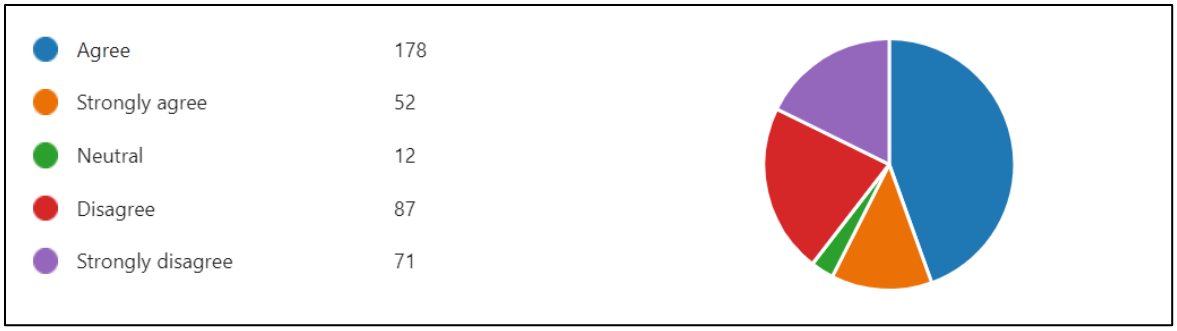

Figure 4.8: The company has invested in modern digital technologies to enhance its operations?

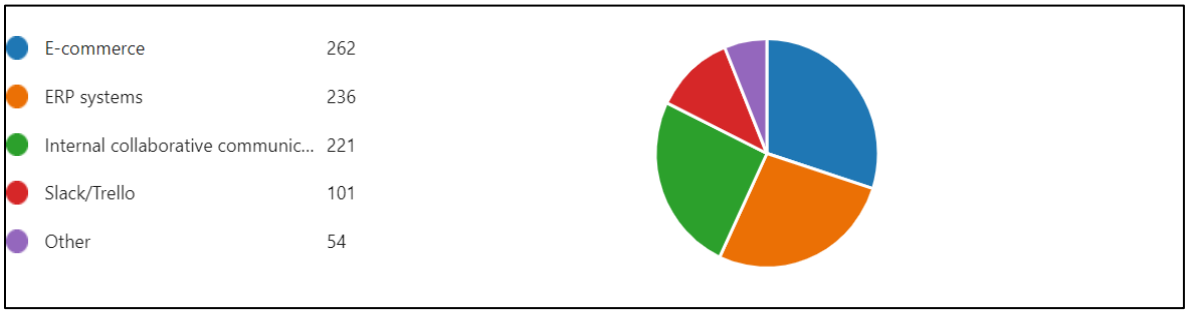

Figure 4.9: What digital technology tool is the company currently using for its processes (please select and list all that apply)?

Table 4.7: What digital technology tool is the company currently using for its processes (please select and list all that apply)?

	Frequency	Percent
Amazon;	13	3.3
Amazon web services;	14	3.5
Amazon;	2	.5
Azure;	1	.3
E-commerce;	54	13.5
E-commerce; ERP systems;	28	7.0

E-commerce; ERP systems; Internal collaborative communication tools (Teams);	71	17.8
E-commerce; ERP systems; Internal collaborative communication tools (Teams); Slack/Trello;	32	8.0
E-commerce; ERP systems; Slack/Trello;	9	2.3
E-commerce; ERP systems; Slack/Trello; Internal collaborative communication tools (Teams);	4	1.0
E-commerce; Internal collaborative communication tools (Teams);	5	1.3
E-commerce; Internal collaborative communication tools (Teams); ERP systems;	2	.5
E-commerce; Internal collaborative communication tools (Teams); Slack/Trello;	1	.3
E-commerce; Slack/Trello; ERP systems;	2	.5
E-commerce; Slack/Trello; Internal collaborative communication tools (Teams);	2	.5
ERP systems;	20	5.0
ERP systems; E-commerce;	6	1.5
ERP systems; E-commerce; Internal collaborative communication tools (Teams);	10	2.5
ERP systems; E-commerce; Internal collaborative communication tools (Teams); Slack/Trello;	5	1.3
ERP systems; E-commerce; Slack/Trello;	2	.5
ERP systems; Internal collaborative communication tools (Teams);	6	1.5
ERP systems; Internal collaborative communication tools (Teams); E-commerce;	4	1.0
ERP systems; Internal collaborative communication tools (Teams); Slack/Trello;	4	1.0
Internal collaborative communication tools (Teams);	24	6.0
Internal collaborative communication tools (Teams); Amazon web services;	1	.3
Internal collaborative communication tools (Teams); E-commerce;	2	.5
Internal collaborative communication tools (Teams); E-commerce; ERP systems; Slack/Trello;	1	.3

Internal collaborative communication tools (Teams); E-commerce; Slack/Trello;	1	.3
Internal collaborative communication tools (Teams); ERP systems;	5	1.3
Internal collaborative communication tools (Teams); ERP systems; E-commerce;	8	2.0
Internal collaborative communication tools (Teams); ERP systems; E-commerce; Slack/Trello;	2	.5
Internal collaborative communication tools (Teams); ERP systems; Slack/Trello;	4	1.0
Internal collaborative communication tools (Teams); Slack/Trello;	7	1.8
Internal collaborative communication tools (Teams); Slack/Trello; E-commerce;	1	.3
Internal collaborative communication tools (Teams); Slack/Trello; ERP systems;	1	.3
Microsoft;	9	2.3
Microsoft azure;	13	3.3
Slack/Trello;	4	1.0
Slack/Trello; E-commerce;	1	.3
Slack/Trello; ERP systems; E-commerce; Internal collaborative communication tools (Teams);	1	.3
Slack/Trello; Internal collaborative communication tools (Teams);	4	1.0
Slack/Trello; Internal collaborative communication tools (Teams); E-commerce;	4	1.0
Slack/Trello; Internal collaborative communication tools (Teams); ERP systems;	5	1.3
Slack/Trello; Internal collaborative communication tools (Teams); ERP systems; E-commerce;	4	1.0
Social media;	1	.3
Total	400	100.0

It is shown from the responses that most SMTEs have adopted not just one but most of these tools to enhance their operations.

On firms' annual revenue, 369 (92.3%) affirmed their annual revenues of less than N300 million, and 21 (5.3%) of between N300 million and N500million. Therefore, the research revealed that a significant majority of SMTEs specifically 92.3% affirmed that their annual revenues were less than N300million, this statistic underscores the predominance of smaller enterprises within the sample, indicating that a substantial proportion of textile businesses in Nigeria operate at a scale below the N300million annual revenue threshold. In contrast, a smaller percentage of SMTEs reported higher annual revenues. Specifically, 5.3% of the enterprises surveyed indicated that their annual revenues fell within the range of N300 million to N500 million. This minority subset represents a segment of SMTEs that have achieved comparatively higher levels of financial performance. So, the concentration of SMTEs with annual revenues below N300 million suggests a reasonable revenue landscape characterized by a significant number of smaller enterprises. This distribution may indicate challenges or constraints that limit the revenue-generating capacity of these businesses, potentially highlighting areas for targeted support and or intervention. Therefore, SMTEs operating within the lower revenue bracket may need to strategize for growth and sustainability, exploring avenues for increasing sales, expanding market reach, and enhancing operational efficiency.

Table 4.8: What is the firm's annual revenue (Approx)

	Frequency	Percent
Less than N300million	369	92.3
N300million – N500million	21	5.3
N500million – N800million	9	2.3
Over N800million	1	.3
Total	400	100.0

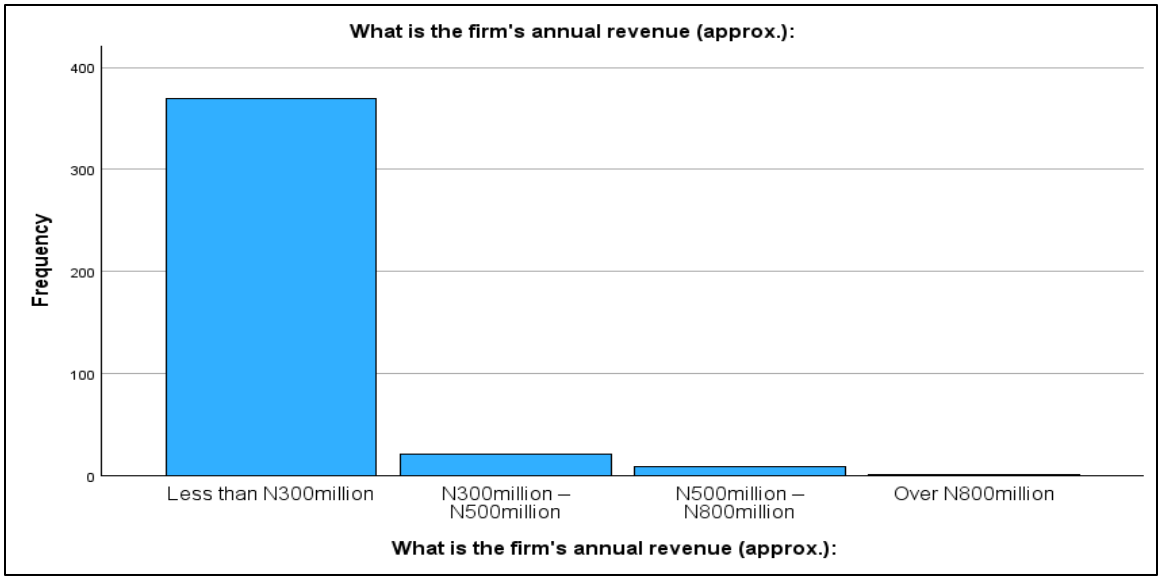

Figure 4.10: What is the firm's annual revenue (Approx.)

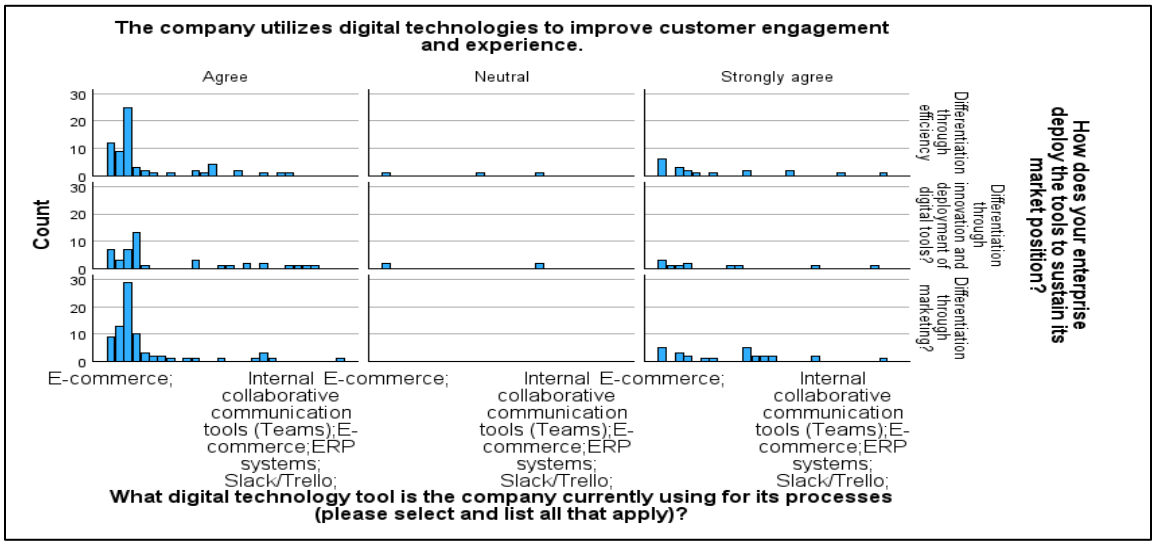

Figure 4.11: The company utilizes digital technologies to improve customer engagement and experience.

For sustenance and optimization of its supply chain processes, 192 (48% agree to implement digital solutions to enhance its supply chain processes, 48 (12%) strongly agree, and 101 (25.25%) strongly disagree.

On implementing digital solutions for supply chain optimization, a significant portion, representing 48% of the respondents (192 participants), agreed with the idea of

implementing digital solutions to enhance their supply chain processes. This indicates a substantial level of openness among SMTEs towards leveraging digital technologies for optimizing and modernizing their supply chain operations. However, a notable percentage comprising 12% of the participants 948 respondents) strongly agreed with the proposition of implementing digital solutions for supply chain enhancement. This group, an altogether smaller proportion, reflects a high level of conviction and enthusiasm for the transformative potential of digital technologies in the supply chain domain. However, a significant subset, accounting for 25.25% of the respondents (101 participants) strongly disagreed with the notion of implementing digital solutions for supply chain optimization. This dissenting perspective suggests a segment of SMTEs that may harbor reservations or concerns about the effectiveness or feasibility of digitalization in their supply chain processes. So, addressing these concerns and promoting awareness of the benefits of digital technologies in supply chain operations can contribute to a more holistic and effective approach to digital transformation in the textile industry.

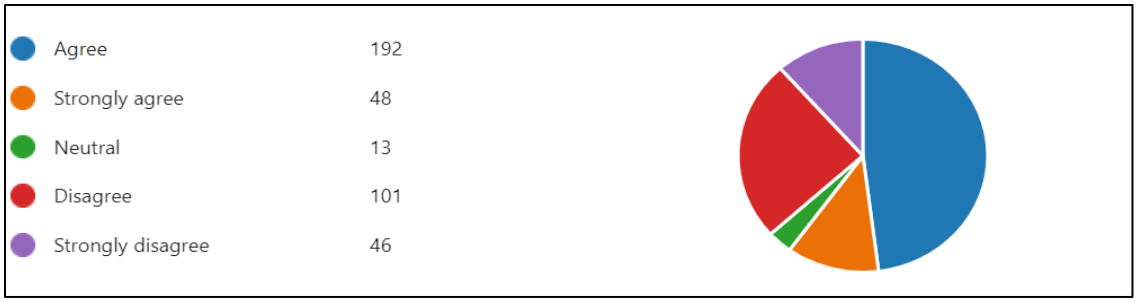

Figure 4.12: The company has implemented digital solutions to optimize its supply chain processes?

To the above terms of strategy to sustain their market position, the respondents responded that they would deploy tools to sustain their market position, 133 (33.25% that they would do this by differentiation through marketing, 140 (35%), differentiation through efficiency, 127 (31.75%) differentiation through innovation.

Figure 4.13: How does your enterprise deploy the tools to sustain its market position?

These findings are consistent with the global trend of SMEs recognizing the importance of digital technologies for operational efficiency.

So, on strategic approaches to sustain market position, the findings align with global trends reflecting the increasing recognition of the pivotal role of digital technologies in achieving operational efficiency and sustaining market competitiveness. A significant portion, comprising 33.25% of the respondents, expressed their intention to deploy differentiation through marketing as a strategic approach to sustain their market position. This suggests a focus on leveraging digital tools for targeted and innovative marketing efforts, emphasizing the importance of standing out in a competitive marketplace. Moreover, the majority of the respondents, representing 35% of the participants (140 respondents), emphasized the strategic importance of differentiation through efficiency. This points to the recognition that operational efficiency, facilitated by digital technologies, can be a key driver for setting businesses apart and ensuring sustainable market positioning. In addition, a substantial percentage accounting for 31,75% of the respondents 9127 participants) highlighted differentiation through innovation as a crucial strategy. This underscores the acknowledgment that continuous innovation, enabled by digital technologies is a cornerstone for maintaining a competitive edge and responding to evolving market demands.

Therefore, the identified strategic approaches align with global trends in business strategy particularly the insights from Porter and Heppelmann (2014). The recognition of

digital technologies as enablers for operational efficiency, marketing differentiation, and innovation resonates with the broader understanding that technology is a key driver of competitiveness in the contemporary business landscape.

The findings underscore the strategic importance that SMTEs in Lagos Nigeria attribute to digital technologies. This recognition indicates a shift toward viewing technology not merely as a tool but as a strategic asset for achieving differentiation and sustaining market position. So, the emphasis on differentiation through innovation and efficiency highlights the evolving expectations within the textile industry. SMTEs recognize the need to innovate in product offerings, processes, and customer experiences while ensuring operational excellence facilitated by digital tools. Leveraging digital technologies for marketing, efficiency, and innovation becomes instrumental in carving a distinctive market position. While the alignment with global trends indicated by Porter and Heppelmann (2014), underscores the adaptability of SMTEs to the changing dynamics of the business environment. Staying abreast of global insights and incorporating digital strategies positions these enterprises for resilience and sustained growth.

On the parts of the firm's processes and businesses that could be further improved with the deployment of digital technologies, the responses are that 136 (34%) noted that sales and marketing can be further improved, with 84 (21%) for production and logistics, while customer service is 50 (12.5%) while finance and quality control and risk management made up of 121 (30.25%). So, the majority of respondents comprising 34% of the participants (136 respondents) identified sales and marketing as key areas that could be further improved with the deployment of digital technologies this underscores the recognition of the pivotal role digital tools play in enhancing outreach, customer engagement, and overall sales and marketing effectiveness.

Moreover, a significant portion representing 21% of the respondents (84 participants) identified production and logistics as reasons why digital technologies could bring about further improvements. This recognition points to the potential for technological interventions to streamline production processes, optimize logistics, and enhance overall operational efficiency.

In addition, a notable percentage accounting for 12.5% of the participants (50 respondents) highlighted customer service as an area where digital technologies could lead to further improvements. This acknowledgment suggests an awareness of the role technology plays in delivering superior customer experience, managing inquiries, and providing timely support. Finance, quality control, and risk management represent 30.5% of the respondents (121 participants) and these areas could benefit from the deployment of digital technologies. This broad category encompasses financial management, ensuring product quality, and mitigating operational risks through digital solutions.

The findings therefore suggest that SMTEs should consider a comprehensive approach to digital solutions encompassing various facets of their operations. Strategic planning, resource allocation, and training initiatives should align with the identified improvement areas to maximize the impact of digital technologies on business outcomes.

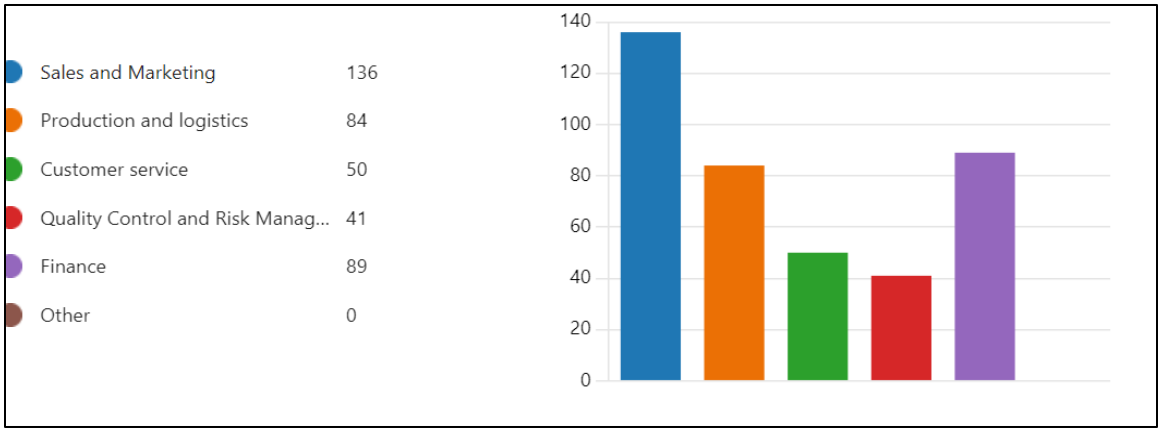

Figure 4.14: Which parts of your operations could be further enhanced by digital tools?

Increased Sales

On sales turnover, 11 respondents representing 4% of the entire number stated N7,000,000 for 2020, 5 respondents, or 2% answered N25,000,000 for 2021 and 6 representing 2% also answered N12,000,000 for 2022. So, the data regarding sales turnover for specific years offers a snapshot of the revenue figures reported by a subset of participants for the years 2020, 2021, and 2022. Among the participants, 4% reported a sales turnover of N7,000,000 for the year 2020. This figure provides insight into the sales performance of a segment of SMTEs within the specified time. For the year 2021, 2% of the respondents, equivalent to 5 participants, stated a sales figure of N25,000,000. This response provides a glimpse of the variation in sales performance among the surveyed enterprises during that particular year. In the case of 2022, 2% of the participants represented by 6 respondents, reported a sales turnover of N12,000,000. This data point further contributes to the understanding of the diverse sales figures reported by the surveyed SMTEs over different periods.

So, the dominance of responses indicating revenues below N300 million underscores the prevalence of smaller revenue brackets among SMTEs. This concentration has implications for resource allocations, financial strategies, and overall business planning within the sector. While there is diversity in the revenue scale, the presence of responses within the N300 million to N500 million range indicates a degree of diversity in the revenue scale among the surveyed companies. This diversity may stem from variations in business models, market positioning, or other factors influencing revenue generation.

So, the reported sales turnover for specific years highlights the variability in performance among SMTEs during the periods. Factors such as market dynamics, economic conditions, and internal operational efficiency may contribute to the fluctuations observed in the reported sales figures.

Meanwhile, on rating the contribution of product quality to increased sales, with a rating scale of 1 – 5, I being the lowest and 5 the highest, 180 respondents 45% rated 5, while 140 representing 35% rated 4. Therefore, with an average rating of 4.25. This indicates a highly positive view/perception. Consequently, respondents believe that product quality significantly influences sales growth, suggesting that perceived value and satisfaction derived from the product play a substantial role in driving increased sales for SMTEs.

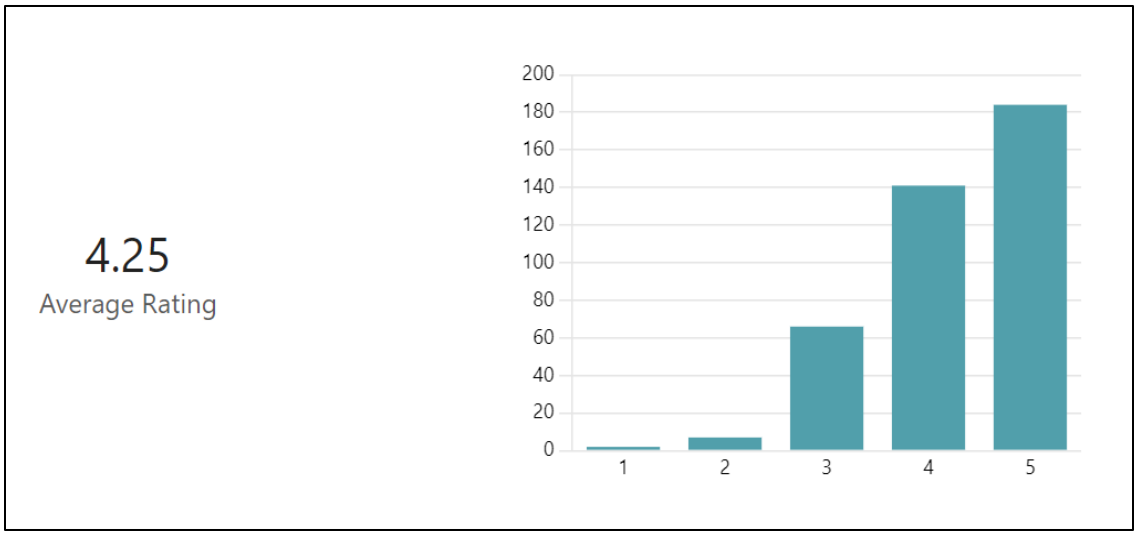

Figure 4.15: Contribution of Product Quality to Increased Sales

The contribution of digital technologies, specifically e-commerce and ERP systems, to increased sales, averaged 3.40 in terms of rating, as depicted in the below chart. This appears in a moderately positive position. So, while the respondents see some value in these systems in enhancing sales, there may be more room for improvement or further optimization to fully realize their potential impact on sales growth for SMTEs.

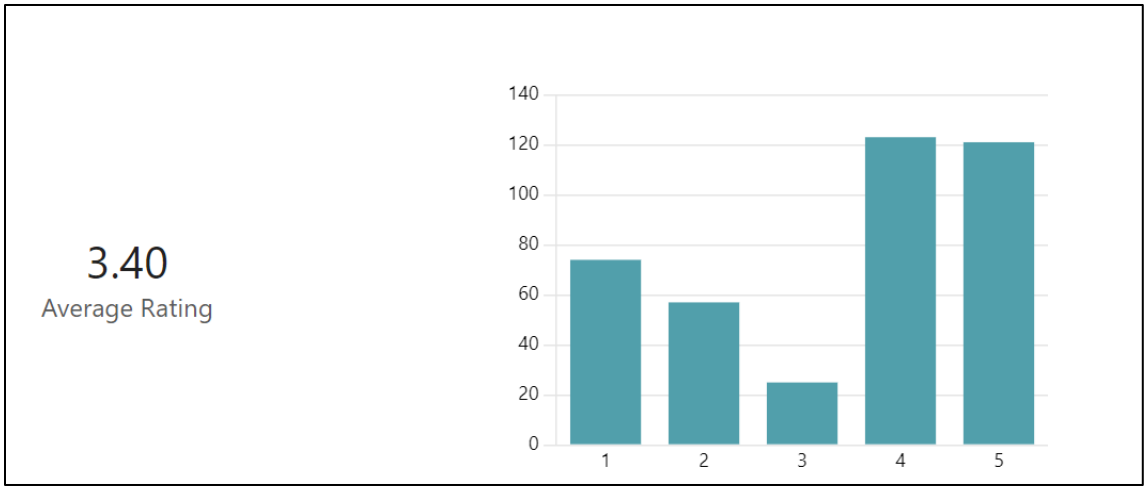

Figure 4.16: Contribution of Digital Technologies (E-Commerce, ERP System) to Increased Sales

The rating also for digital technologies' contribution of customer service to increased sales averaged a 4.16 average rating.

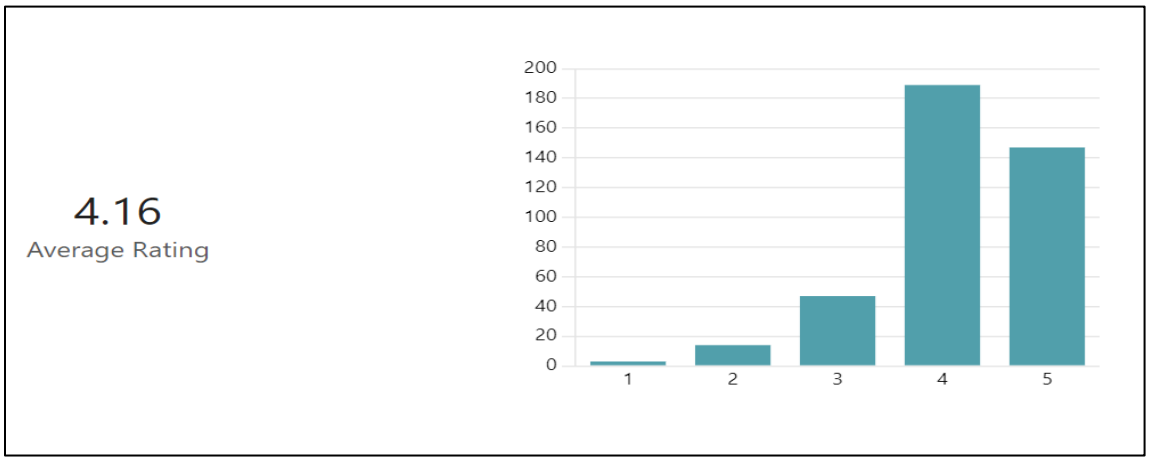

Figure 4.17: Contribution of Customer Service to Increased Sales

More so, data from the respondents also rated the contribution of marketing and branding to increased sales at an average of 4.18, an average rating with 83% rating between 4 and 5. The average rating suggests a generally positive perception. The respondents likely recognize the importance of effective marketing and branding in driving sales growth, indicating a strong belief that these aspects play a significant role in enhancing the overall performance of SMTEs.

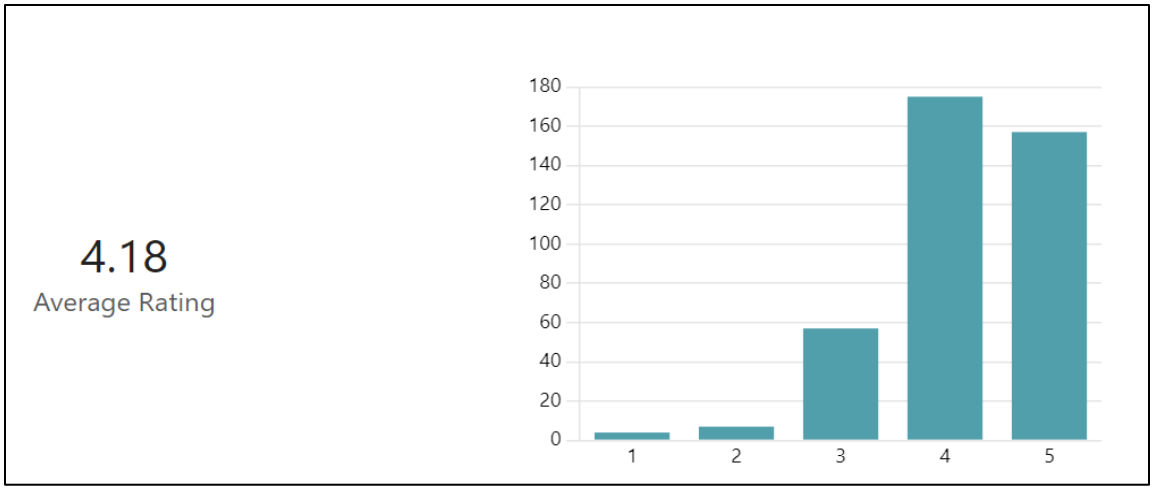

Figure 4.18: Contribution of Marketing and Branding to Increased Sales

In addition, the contribution of innovation to increased sales was also rated 4.14 average rating with 80% of the respondents rating between 4 and 5 by the respondents. The average score indicates a positive perception and so an acknowledgement by respondents regarding the importance of innovation in driving sales growth and a further suggestion that implementing innovative practices, products, or processes can have a significant impact on enhancing the performance and competitiveness of SMEs.

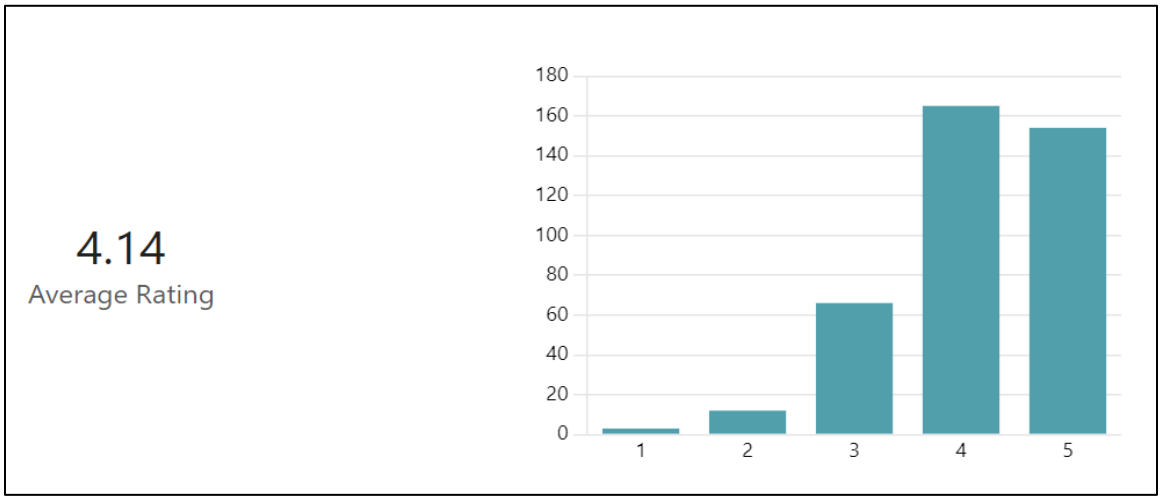

Figure 4.19: Contribution of Innovation to Increased Sales

For distribution and logistics to increase sales, the average rating is 4.16, an average rating of 83% between 4 and 5. So an average rating of 4.16 for the contribution of

distribution and logistics to increased sales suggests a positive perception. The respondents likely recognize the significance of efficient distribution and logistics operations in driving sales growth. This indicates a belief that optimizing distribution channels and logistics processes can have a notable impact on enhancing the overall sales performance of the business.

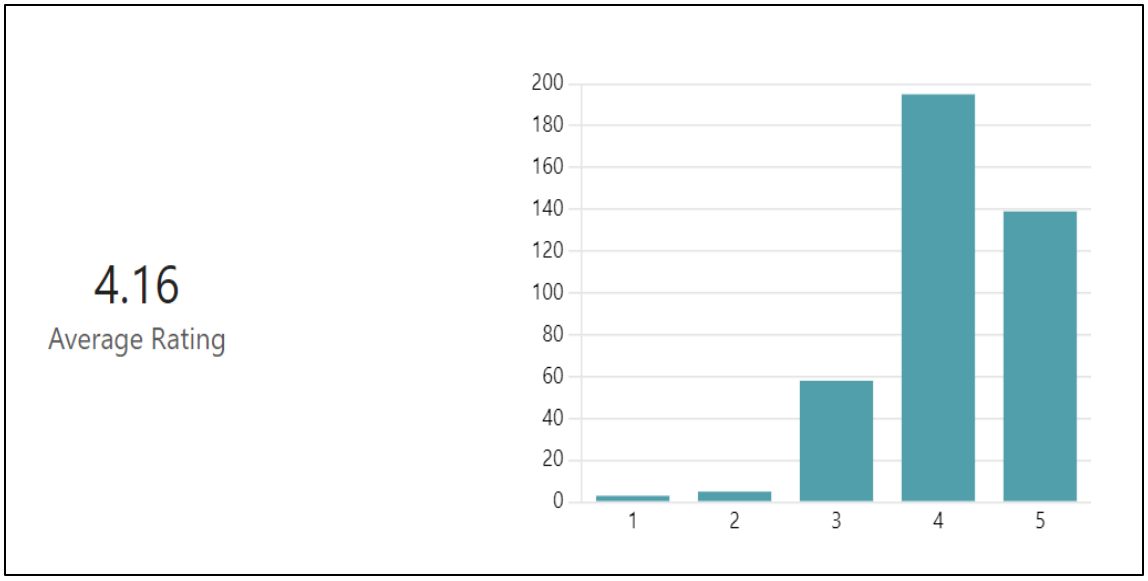

Figure 4.20: Contribution of Distribution and Logistics to Increased Sales

The sales team's performance is also a fundamental contributor to increased sales. The response from the respondent's evidences this as this averaged 4.21 average rating, with 87% of respondents advising between 4 and 5. The average rating of 4.21 reflects a highly positive perception. The respondents believe that the effectiveness and proficiency of the sales teams play a substantial role in driving sales growth. This suggests a strong conviction that a high-performing sales team contributes significantly to the overall success and increased sales of the business (SMTEs).

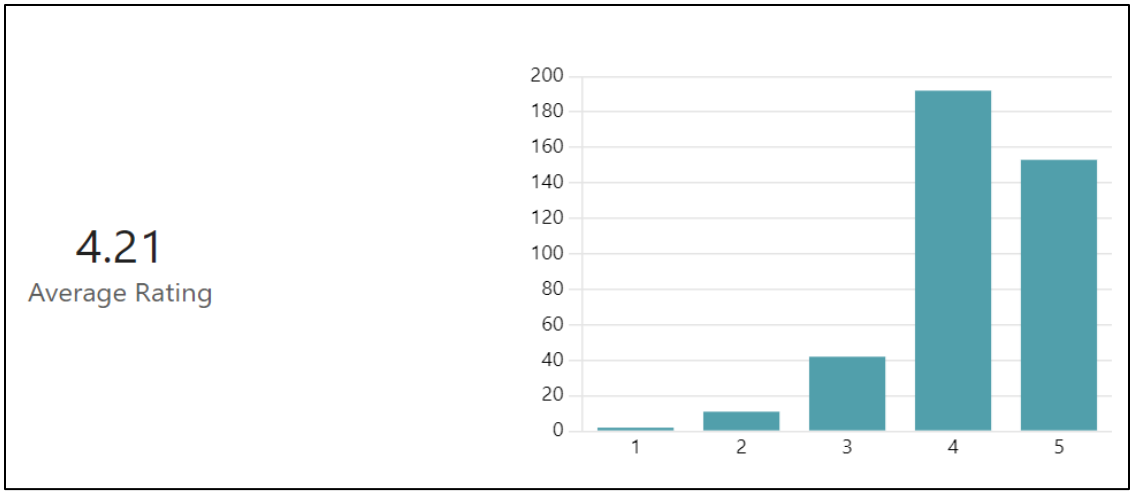

Figure 4.21: Contribution of Sales Team Performance to Increased Sales

On competitor analysis to increased sales, the respondents' response averaged a 4.13 average rating with 82% of the respondents advising between 4 and 5. An average rating of 4.13 indicates a positive perception. So, the respondents recognize the value of conducting competitor analysis in driving sales growth, suggesting a belief that understanding and responding to market dynamics and competitive strategies contribute significantly to the overall success and increased sales of the business.

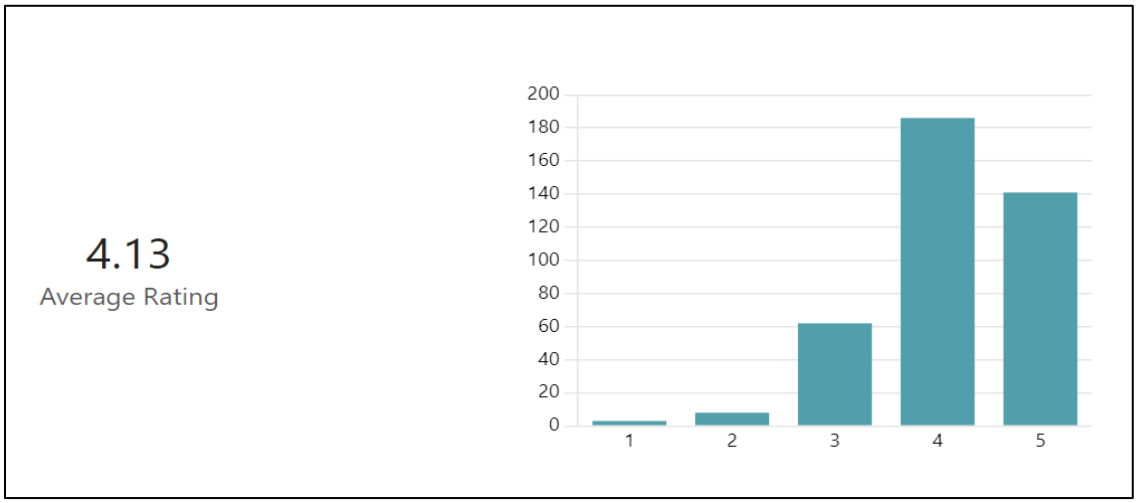

Figure 4.22: Contribution of Competitors Analysis to Increased Sales

To add data from the respondents indicates that cultural considerations are also a contributor to increased sales as their responses averaged a 4.14 average rating, with 83%

of respondents responding between 4 and 5. This rating suggests a positive outcome/perception. Respondents likely acknowledge the importance of cultural factors in driving sales growth, indicating a belief that understanding and incorporating cultural considerations can significantly impact the success and increased sales of the business, especially in diverse or global markets.

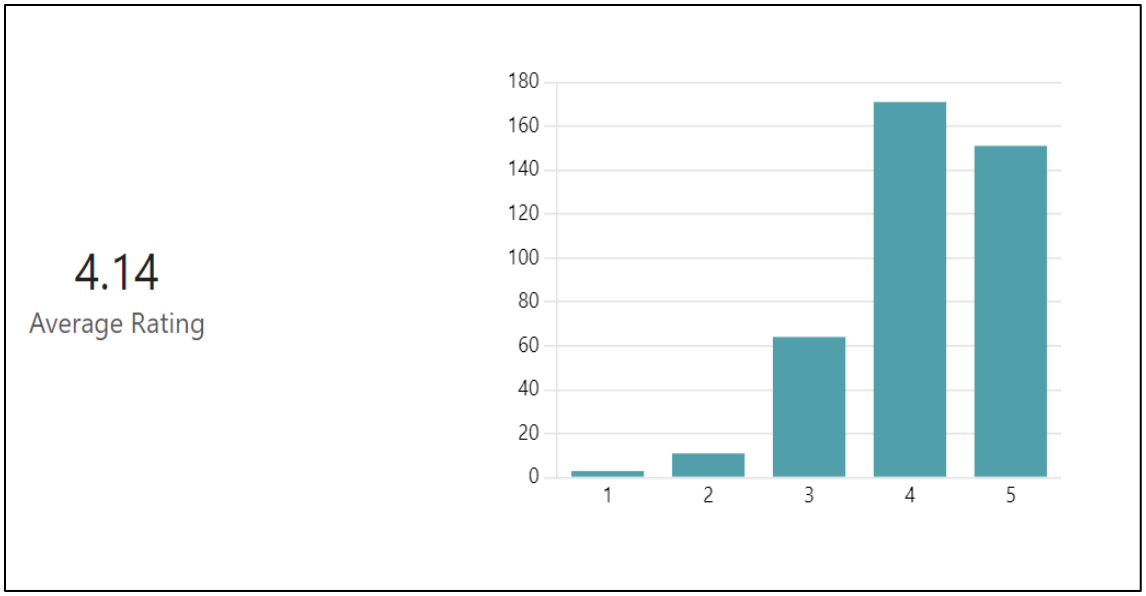

Figure 4.23: Contribution of Cultural Considerations to Increased Sales

The appropriate pricing strategy is also another contributor to increased sales, as we see from the respondents' data collection, with this averaging 4.15 as 82% of respondents between 4 and 5. An average rating of 4.15 for the contribution of an adequate pricing strategy to increased sales reflects a positive perception. Respondents likely recognize the importance of pricing strategy in driving sales growth, indicating a belief that setting the right prices for products or services can have a significant impact on attracting customers and ultimately increasing sales for the business.

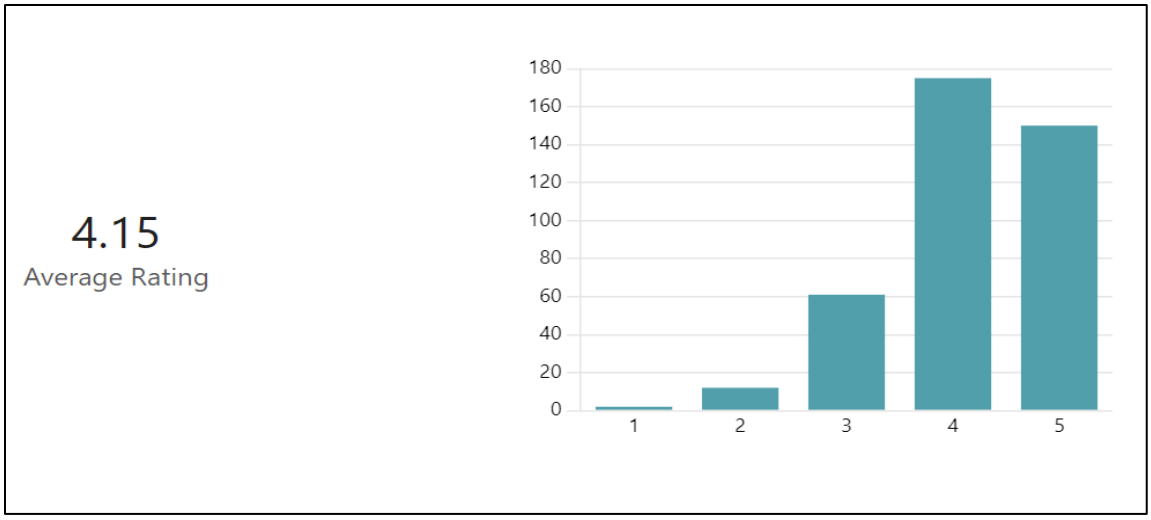

Figure 4.24: Contribution of Pricing Strategy to Increased Sales

4.3 Sales Turnover

The following data shows the sales turnover in the last three years (2020, 2021, 2022) from the respondents.

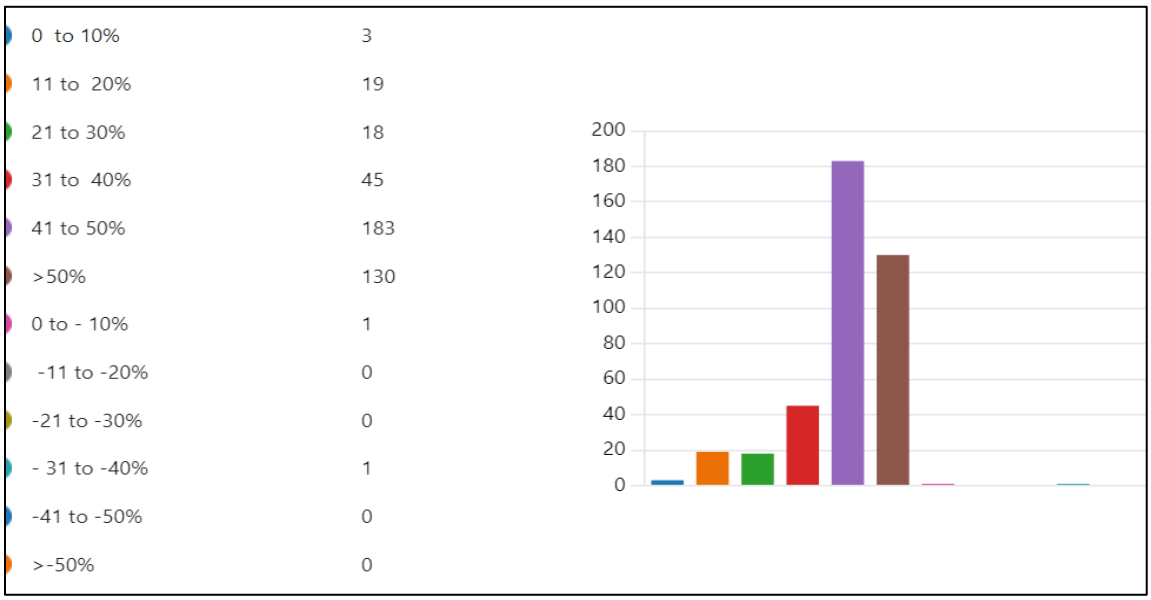

Figure 4.25: Sales Turnover in the Last Three Years

From the above, the respondent's response indicates that digital technologies, specifically e-commerce and ERP systems will and have contributed to the firm's increased sales volume.

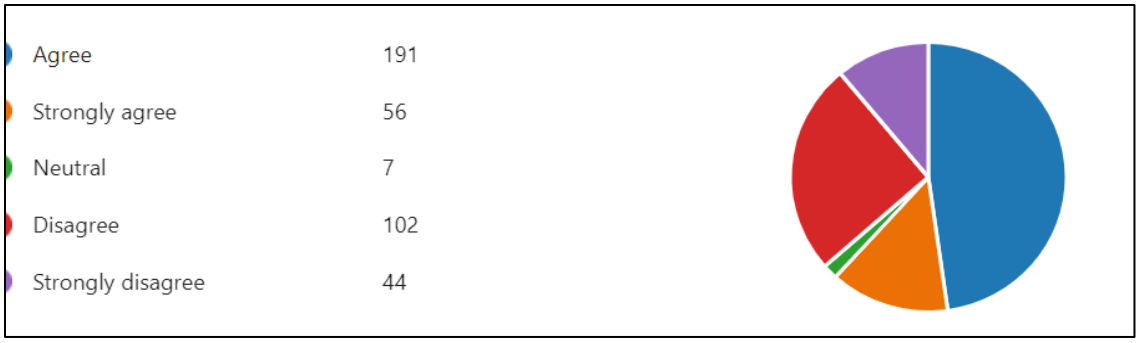

Figure 4.26: Digital technologies (e-commerce and/or ERP systems) have/will contribute to the firm's increased sales volume

SMEs that adopted e-commerce reported a significant increase in sales, with an average growth rate of 51%. This supports the argument that e-commerce can expand market reach and enhance sales. Consequently, e-commerce can indeed expand market reach and enhance sales by allowing businesses to reach customers beyond their physical location and possibly operate online 24/7. So, an average growth rate of 51% would strongly support this argument, as it demonstrates a significant increase in sales over time, indicating that the adoption of e-commerce is positively impacting the businesses' ability to reach new customers and drive sales growth.

4.4 Market Size Expansion

On market size, for 2020, of the 250 respondents, 46 respondents representing 18% answered N5,000,000, 5 respondents (2%) responded N15,000,000 for 2021 and 5 (2%) responded N3,000,000 for 2022.

As to whether digital transformation has helped to expand the firm's market reach, 48% of the respondents agreed that it has helped. The level of respondents shows a moderate level of consensus that digital transformation helps to expand firms' market reach. While not an overwhelming majority, the positive responses suggest that a substantial portion of respondents acknowledge the positive impact of digital transformation on broadening the firm's market reach.

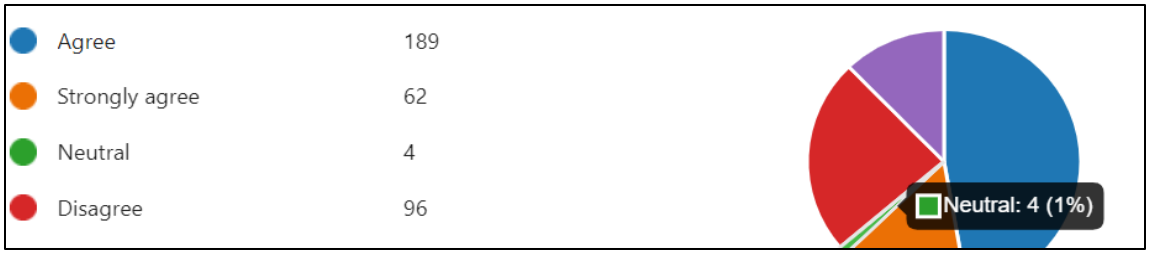

Figure 4.27: Digital Transformation Has Helped To Expand The Firm's Market Reach

In addition, digital technologies have also helped them in attracting new customers, 46% of the respondents agree with this. With 46% of respondents agreeing that digital transformation has helped attract new customers, there is a moderate level of consensus. While not a majority, the positive responses suggest that a significant portion of respondents acknowledge the role of digital transformation in attracting new customers to the firm.

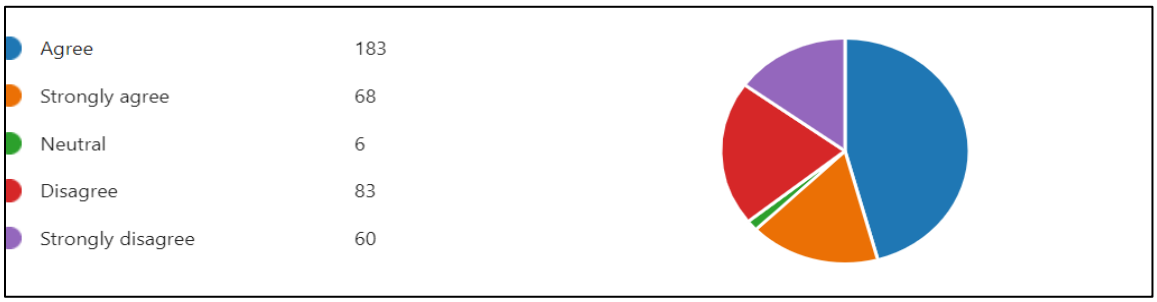

Figure 4.28: Digital Technologies have helped us attract new customers

On the contribution of innovation to expanding the firm's market size, 88% of the respondents advised a score of between 4 – 5 and an average score distribution of 4.28. so, an average score of 4.28 with 88% of respondents agreeing on the contribution of innovation to expanding the firm's market size indicates a highly positive and strong consensus. The overwhelmingly positive response suggests that most respondents firmly believe that innovation plays a crucial role in expanding the firm's market size. This high level of agreement and positive average score highlights the perceived importance of innovative practices in driving the growth and reach of the business.

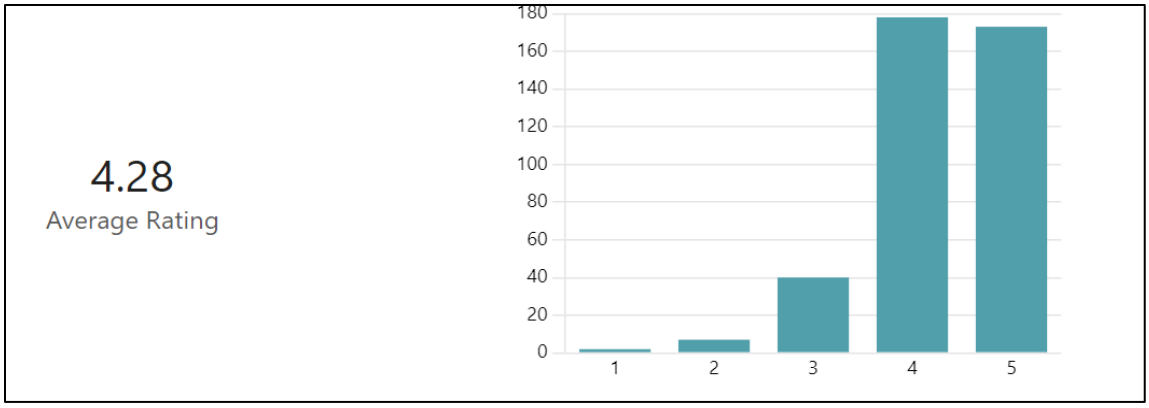

Figure 4.29: Contribution Of Innovation To Expanding The Firm's Market Size

For the contribution of product diversification to expanding the firm's market size, the average rating is 4.09, with 86% respondents rating of between 4 – 5. An average rating of 4.09 from 86% of respondents regarding the contribution of product diversification to expanding the firm's market size suggests a positive and generally favorable perception. The majority agreement implies that respondents recognize the significance of product diversification in broadening the firm's market reach. While not an overwhelming consensus, the combination of a high average rating and a substantial percentage of agreement indicates that many respondents view product diversification as a valuable strategy for expanding the business's market size.

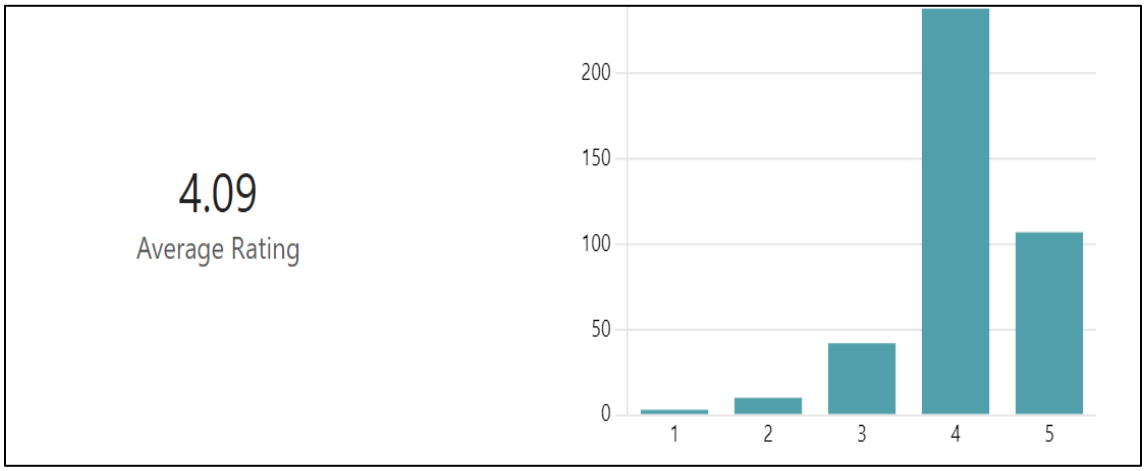

Figure 4.30: Contribution Of Product Diversification To Expanding The Firm's Market Size

The average rating for the contribution of a strategic partnership to expanding the firm's market size averaged rating is 4.16, with 83% of respondents scoring between 4 – 5. So, an average rating of 4.16 from 83% of respondents regarding the contribution of a strategic partnership to expanding the firm's market size indicates a highly positive perception. The strong agreement among respondents suggests that the majority recognize the significant impact of strategic partnerships in broadening the firm's market reach. This high level of consensus combined with the positive average rating highlights the perceived importance of forming strategic partnerships as a valuable strategy for expanding the business's market size.

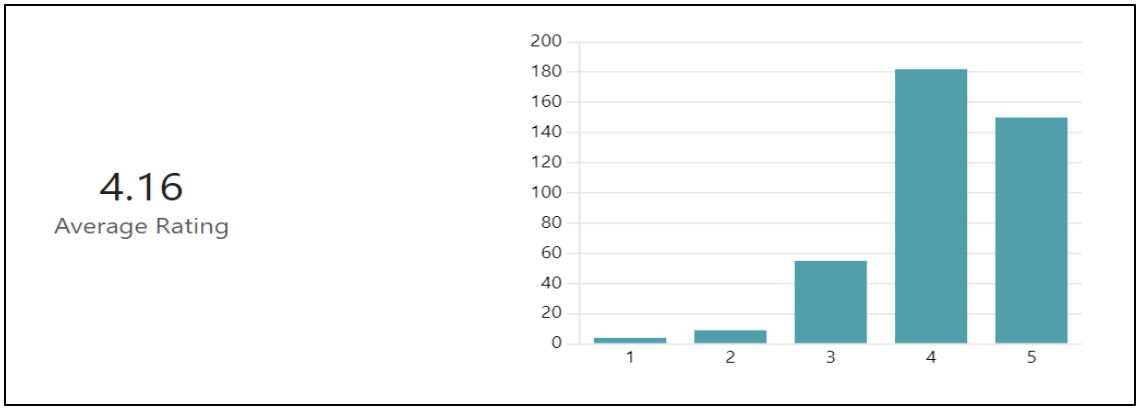

Figure 4.31: Contribution of A Strategic Partnership To Expanding The Firm's Market Size

For the contribution of sustainable practices to expanding the firm's market size, and the contribution of customer segmentation to expanding the firm market size, the average rating for both respondents stands at 4.17. An average rating of 4.17 for both the contribution of sustainable practices and customer segmentation to expand the firm's market size indicates a consistently positive perception. Respondents, with a high level of agreement, recognize the importance of both sustainable practices and effective customer segmentation in broadening the firm's market reach. This suggests a dual acknowledgment

that incorporating sustainability and understanding customer segments are valuable strategies for expanding the business's market size.

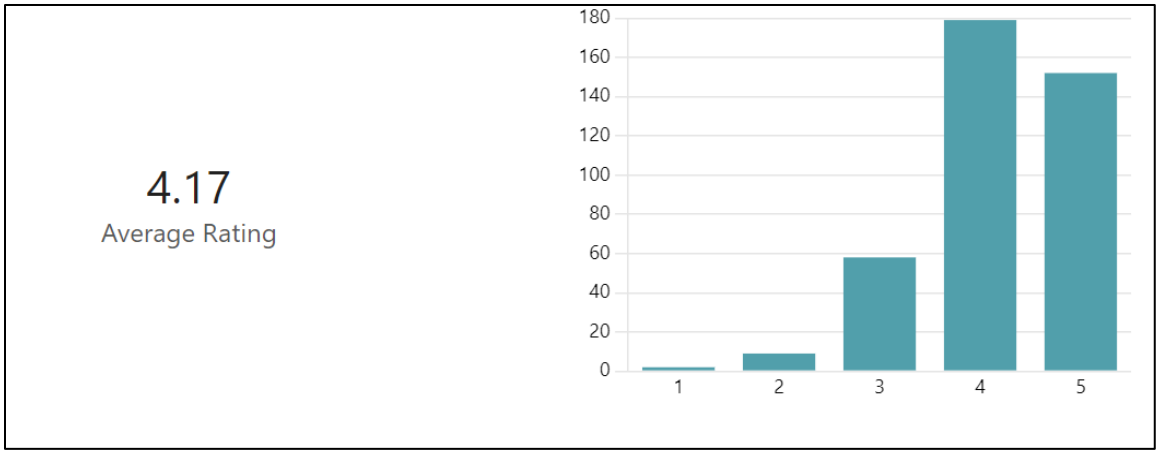

Figure 4.32: Contribution of Sustainable Practices To Expanding The Firm's Market Size

Consequently, the contribution of digital marketing to firms expanding the firm's market reaches/geographic expansion average rating of 3.56. So, the average rating of 3.56 for the contribution of digital marketing to expanding the firm's market reach or geographic expansion suggests a moderately positive perception. While there is some acknowledgment of digital marketing's role in expanding market reach, the rating indicates that respondents may not view it as overwhelmingly influential compared to other factors.

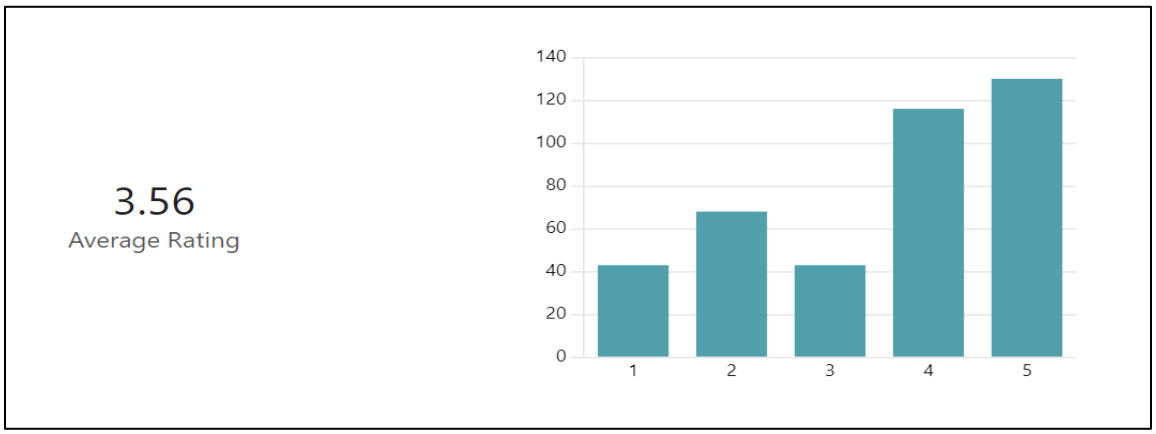

Figure 4.33: Contribution Of Digital Marketing To Firms Expanding The Firm's Market Reaches/Geographic Expansion

Averaging 4.00 for the contribution of referral programs to expanding the firm's market size, with 74% of respondents answering between 4 and 5. An average rating of 4.00 with 74% of respondents regarding the contribution of referral programs to expanding the firm’s market size indicates a generally positive perception. The majority agreement suggests that respondents recognize the significance of referral programs in broadening the firm’s market reach. This level of consensus, combined with the positive average rating, highlights the perceived importance of referral programs as an effective strategy for expanding the business’s market size.

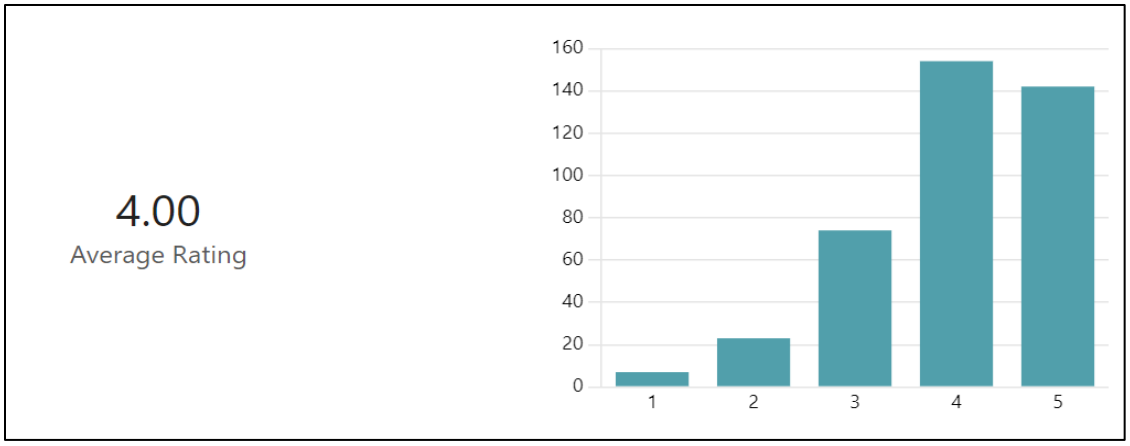

Figure 4.34: Contribution Of referral programs to expanding the firm's market size

Of significance also is to note the contribution of digital technology (e-commerce, ERP systems and others) to expanding the firm’s market size geographic expansion. While this averages 3.43, with 63% of respondents rating between 4 – 5. An average rating of 3.43 with 63% of respondents for the contribution of e-commerce and ERP systems to expanding the firm’s market size and geographic expansion suggests a moderately positive perception. While there is some acknowledgment of the role of e-commerce and ERP systems in market expansion, the rating indicates that not all respondents may see these systems as overwhelmingly influential for geographic growth.

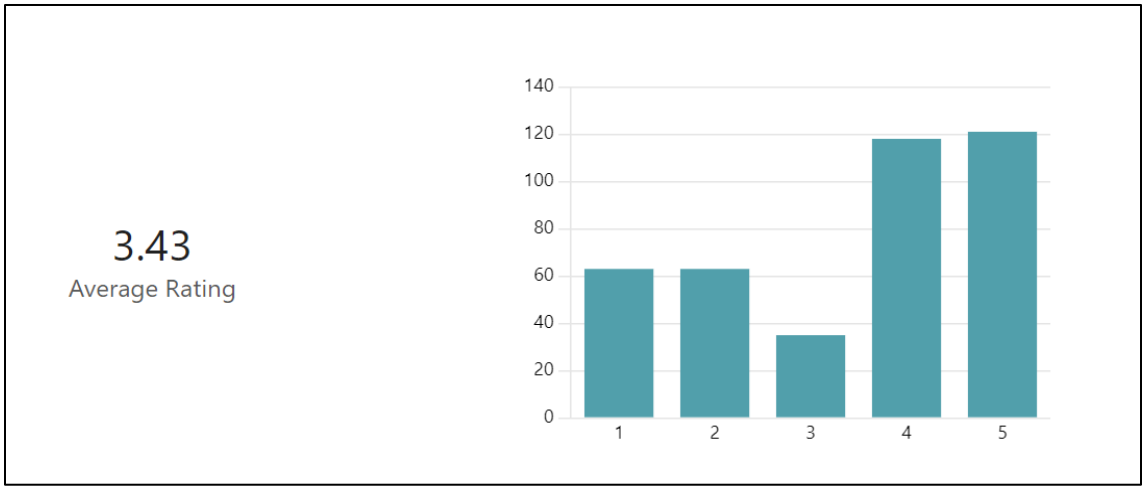

Figure 4.35: Contribution Of digital technology (e-commerce, ERP systems and others) to expanding the firm's market size geographic expansion

The respondents also provided their responses to the contribution of government policies/incentives to expanding the firm's market size geographic expansion an average rating of 4.34. an average rating of 4.34 for the contribution of government policies/incentives to expanding the firm's market size and geographic expansion indicates a highly positive perception. The substantial agreement among respondents suggests a strong belief in the positive impact of government policies and incentives in facilitating the firm's market expansion efforts. This high level of consensus, combined with the positive average rating, highlights the perceived importance of supportive government measures as a significant factor in expanding the business market size and geographic reach.

Moreover, an average rating of 3.79 for the contribution of government policies/incentives to expand the firm's market size suggests a moderately positive perception. While respondents acknowledge some impact of government policies and incentives, the rating indicates that there might be room for improvement or areas where these policies could be more effective in supporting market expansion efforts.

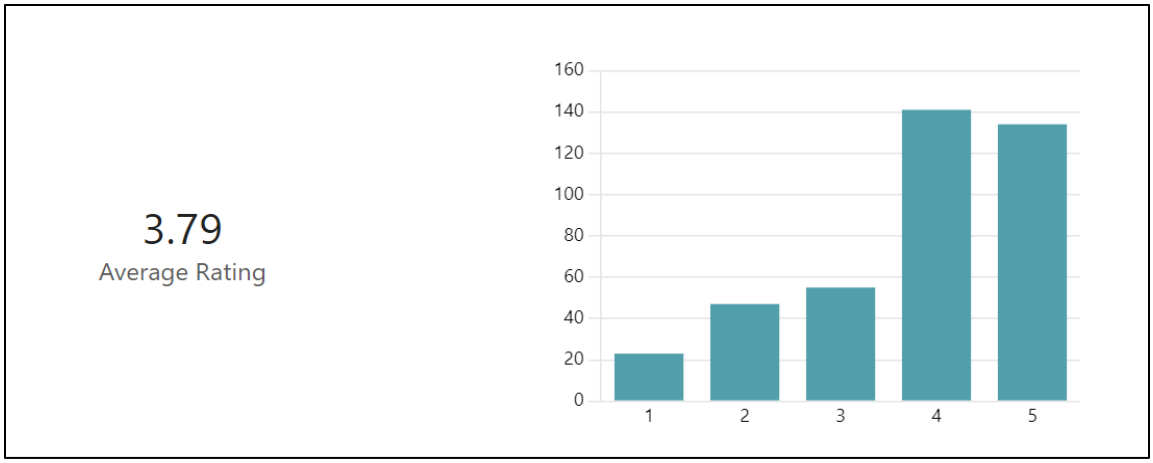

Figure 4.36: Contribution Of Government policies/incentives to expanding the firm's market size geographic expansion

Further to the above and on market size, the descriptive statistics using SPSS is as shown below.

Table 4.9: Descriptive Statistics For Market Size Expansion

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
What was your enterprise market size (revenue) in 2020?	400	0	2300000000	19829086.48	1261683 14.405	15.329	.122	269.753	.243
What was your enterprise market size (revenue) in 2021?	400	0	2300000000	22980541.68	1264354 90.719	15.112	.122	265.672	.243
What was your enterprise market size (revenue) in 2022?	400	1	4500000000	47517391.08	2946649 66.212	12.818	.122	177.662	.243

On a scale from 1-5, please rate the contribution of innovation to expanding the firm's market size, Geographic expansion.	400	1	5	4.28	.754	-1.047	.122	1.513	.243
On a scale from 1-5, please rate the contribution of product diversification to expanding the firm's market size Geographic expansion.	400	1	5	4.09	.730	-.995	.122	2.319	.243
On a scale from 1-5, please rate the contribution of strategic partnership to expanding the firm's market size Geographic expansion.	400	1	5	4.16	.817	-1.000	.122	1.378	.243
On a scale from 1-5, please rate the contribution of sustainable practices to expanding the firm's market size	400	1	5	4.18	.794	-.836	.122	.721	.243

Geographic expansion.									
On a scale from 1-5, please rate the contribution of customer segmentation to expanding the firm's market size Geographic expansion.	400	1	5	4.11	.829	-.839	.122	.752	.243
On a scale from 1-5, please rate the contribution of digital marketing to expanding the firm's market size Geographic expansion.	400	1	5	3.55	1.374	-.562	.122	-1.017	.243
On a scale from 1-5, please rate the contribution of referral programs to expanding the firm's market size Geographic expansion.	400	1	5	4.00	.964	-.865	.122	.373	.243

On a scale from 1-5, please rate the contribution of digital technology (e-commerce, ERP Systems and others) to expanding the firm's market size Geographic expansion.	400	1	5	3.43	1.454	-.487	.122	-1.201	.243
On a scale from 1-5, please rate the contribution of government policies/incentives to expanding the firm's market size Geographic expansion.	400	1	5	3.79	1.191	-.830	.122	-.263	.243
On a scale from 1-5, please rate the contribution of government policies/incentives to adoption of digital technology.	400	1	5	3.48	1.451	-.500	.122	-1.189	.243
On a scale from 1-5, please rate the contribution of government	400	1	5	3.50	1.434	-.503	.122	-1.157	.243

policies/incentives to adoption of digital technology.2									
Valid N (listwise)	0								

4.5 Customer Engagement and Satisfaction

On whether there is any impact of digital technologies specifically e-commerce and/or ERP systems on customer engagement and satisfaction in the firms' textile enterprises, 31 (12.4%) stated very significant impact, 85 (34%) stated significant impact, and 98 (39.2%) said moderate impact. However, 36 (14.4%) said slight or no impact.

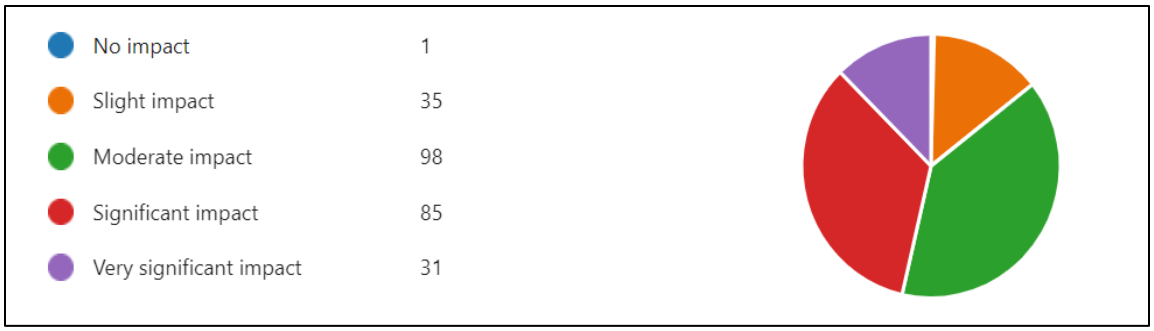

Figure 4.37: Impact of digital technologies, specifically e-commerce and/or ERP systems, on customer engagement and satisfaction.

On the above, the impact on customer engagement and satisfaction average rating is 4.59, with 90% of respondents averaging between 4 – 5. The survey results indicate a highly positive impact of e-commerce and ERP systems on customer engagement and satisfaction in textile enterprises. With 90% of respondents providing an average rating of 4.59, the overwhelming majority acknowledge the significance of these systems. The distribution of responses, including 12.4%, considering the impact very significant and 34% as significant, suggests that e-commerce and ERP systems play a vital role in boosting customer engagement and satisfaction within the textile industry.

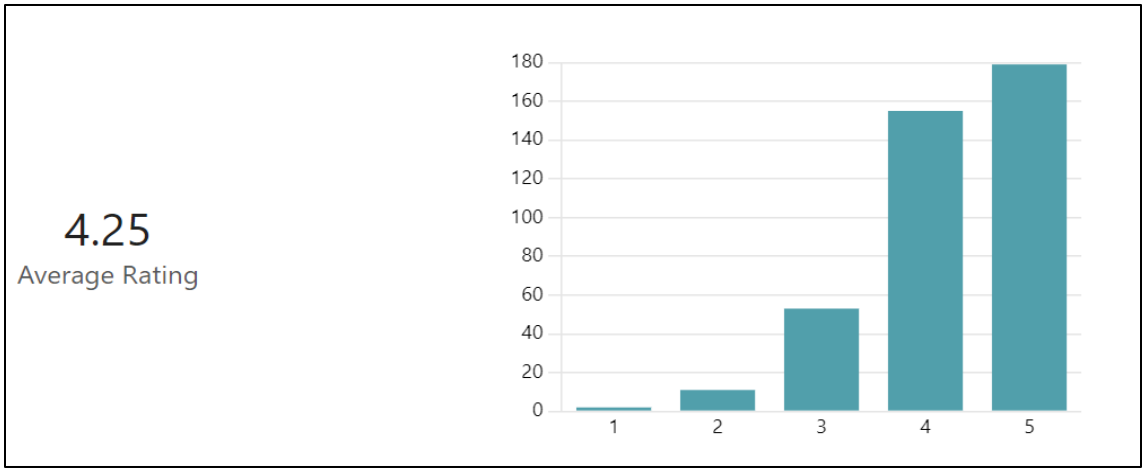

Figure 4.38: High-Quality Products Have Impact on Customer Engagement and Satisfaction

In addition, the influence of excellent customer service on customer engagement and satisfaction averaged 4.25 with 80% of respondents averaging between 4 – 5. An average rating of 4.25 for the influence of excellent customer service on customer engagement and satisfaction, with 80% of respondents, indicates a highly positive and consistent perception. The majority agreement suggests that respondents firmly believe excellent customer service has a substantial and positive impact on customer engagement and satisfaction. This strong consensus underscores the importance of prioritizing and maintaining high-quality customer service practices within the business.

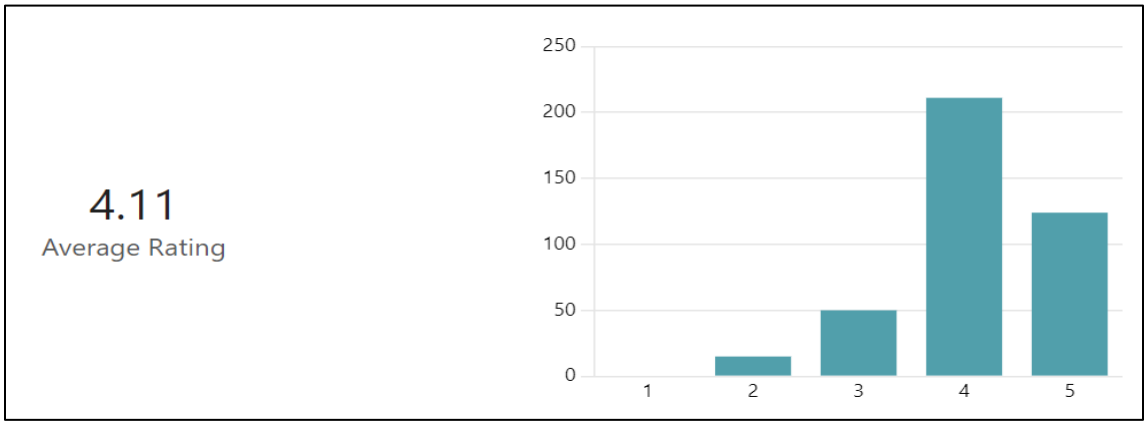

Figure 4.39: Excellent Customer Services Have Impact on Customer Engagement and Satisfaction

The data also reveals an average rating of 4.15 for the impact of social media engagement on customer engagement and satisfaction, with 79% respondents rating of between 4 – 5. An average rating of 4.15 for the impact of social media engagement on customer engagement and satisfaction, with 79% of respondents, suggests a highly positive perception. The majority agreement indicates that respondents recognize the significant influence of social media engagement in enhancing customer satisfaction and engagement. This positive consensus underscores the importance of leveraging social media platforms effectively to come in contact with clients and positively impact their overall satisfaction and engagement with the business.

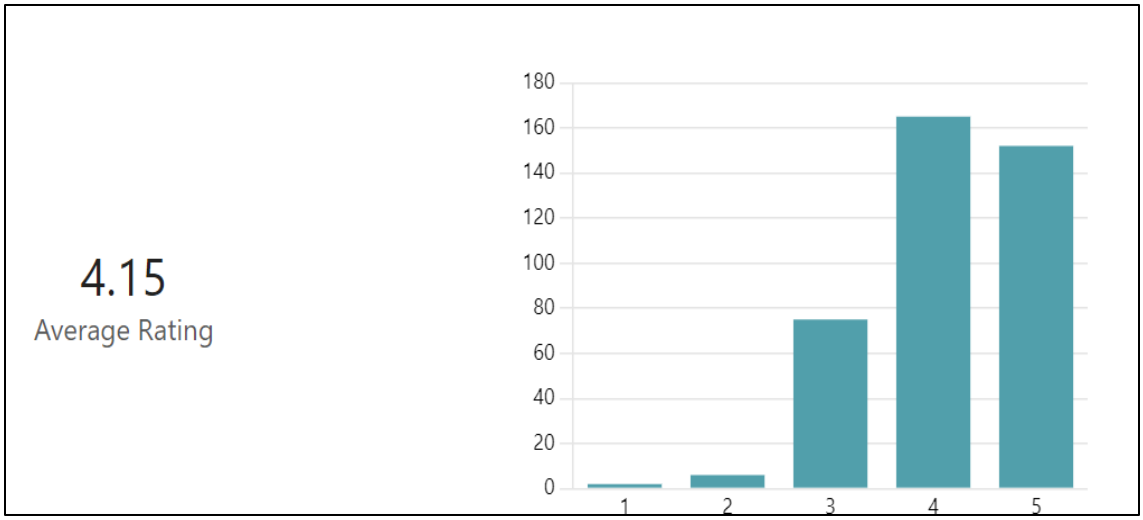

Figure 4.40: Social Media Engagement Have Impact on Customer Engagement and Satisfaction

Clear communication and messaging also have an impact on customer engagement and satisfaction with a response rating averaging 4.12. An average rating of 4.12 for the impact of clear communication and messaging on customer engagement and satisfaction suggests a highly positive perception. Respondents recognize the significance of clear communication and messaging in enhancing customer satisfaction and engagement. This positive rating underscores the importance of effectively communicating with customers

to meet their needs and expectations, eventually resulting in higher levels of satisfaction and engagement with the business.

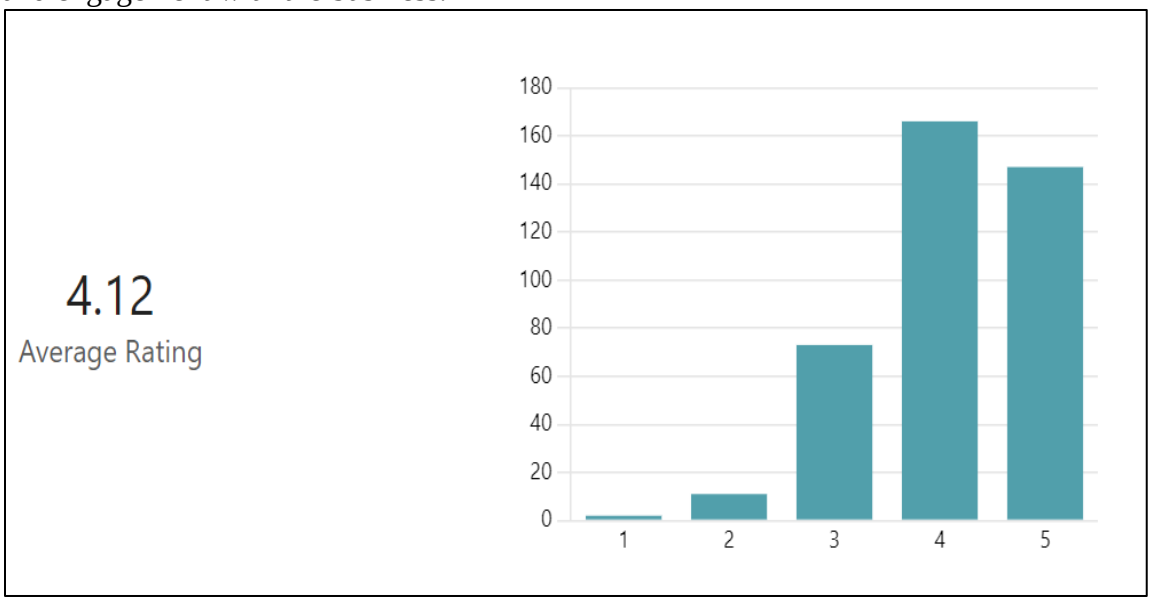

Figure 4.41: Clear Communication Have Impact on Customer Engagement and Satisfaction

On the impact of personalized customer experience on customer engagement and satisfaction, the average rating from the respondents also stands at 4.09 with 77% of the respondents averaging between 4 – 5. An average rating of 4.09 for the impact of personalized customer experience on customer engagement and satisfaction, with 77% of respondents, suggests a strongly positive perception. The majority agreement indicates that respondents recognize the considerable influence of personalized customer experiences in enhancing satisfaction and engagement. This represents the value of tailoring interactions to individual customer preferences and the need to foster positive relationships and overall satisfaction with the business.

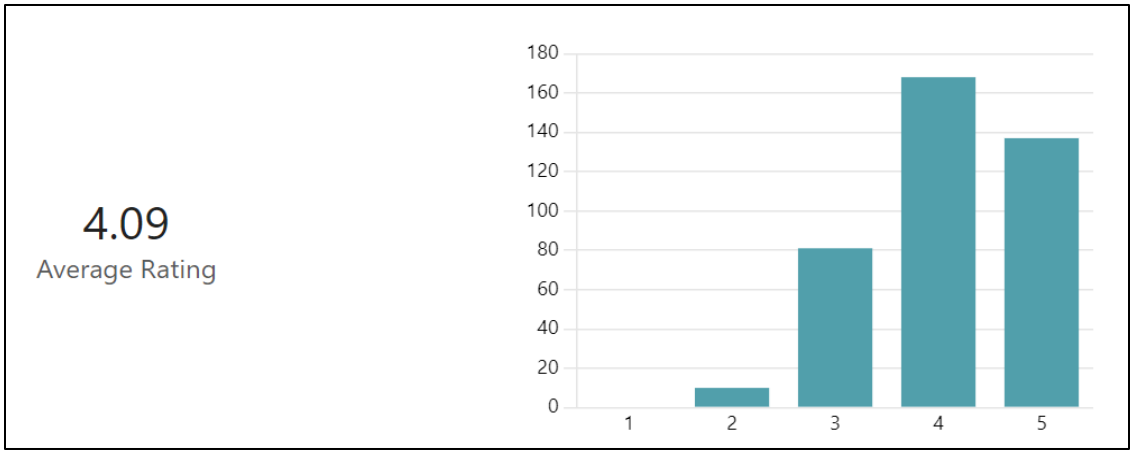

Figure 4.42: Personalized Customer Experience Have Impact on Customer Engagement and Satisfaction

For the impression of personalized digital technology adoption and implementation and its persuasion on customer engagement and satisfaction, the respondents averaged 3.49. An average rating of 3.49 for the consequence of personalized digital technology adoption and implementation on customer engagement and satisfaction suggests a moderately positive perception. While there is an acknowledgement of the impact, the rating indicates that respondents may see room for improvement or refinement in the implementation of personalized digital technology to enhance customer engagement and satisfaction.

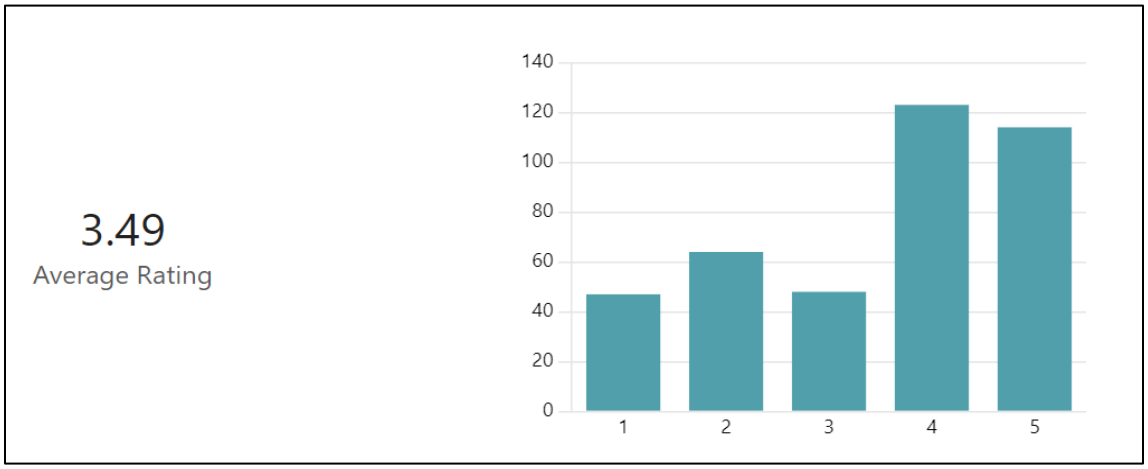

Figure 4.43: Personalized Digital Technology Adoption And Implementation Have Impact on Customer Engagement and Satisfaction

While it is 3.99 for the impact of personalized rewards and loyalty programs on customer engagement and satisfaction. An average rating of 3.99 for the impact of personalized rewards and a loyalty program on customer engagement and satisfaction suggests a moderately positive perception. Respondents acknowledge the influence of personalized rewards and loyalty programs, but the rating indicates there may be room for improvement or optimization to enhance their impact on customer engagement and satisfaction. Further analysis or feedback may be needed to identify specific areas where adjustments can be made to maximize the effectiveness of personalized rewards and loyalty initiatives.

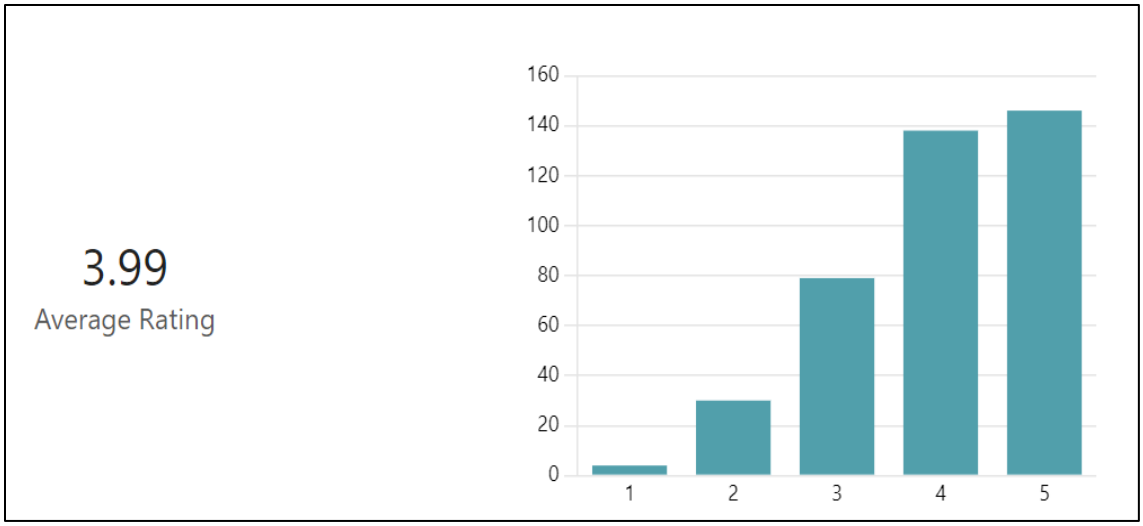

Figure 4.44: Personalized Rewards And Loyalty Programs Have Impact on Customer Engagement and Satisfaction

There is also the impact of easy return and exchange policies on customer engagement and satisfaction, with the responses averaging 3.98 as 74% of respondents answered between 4 – 5. An average response of 3.98 with 74% of respondents for the impact of easy return and exchange policies on customer engagement and satisfaction suggests a moderately positive perception. Most respondents acknowledge the significance of easy return and exchange policies indicating their importance in customer satisfaction

and engagement. While not overwhelmingly high, the rating indicates that these policies are generally viewed as having a positive impact on customer experience, with some potential areas for improvement or optimization.

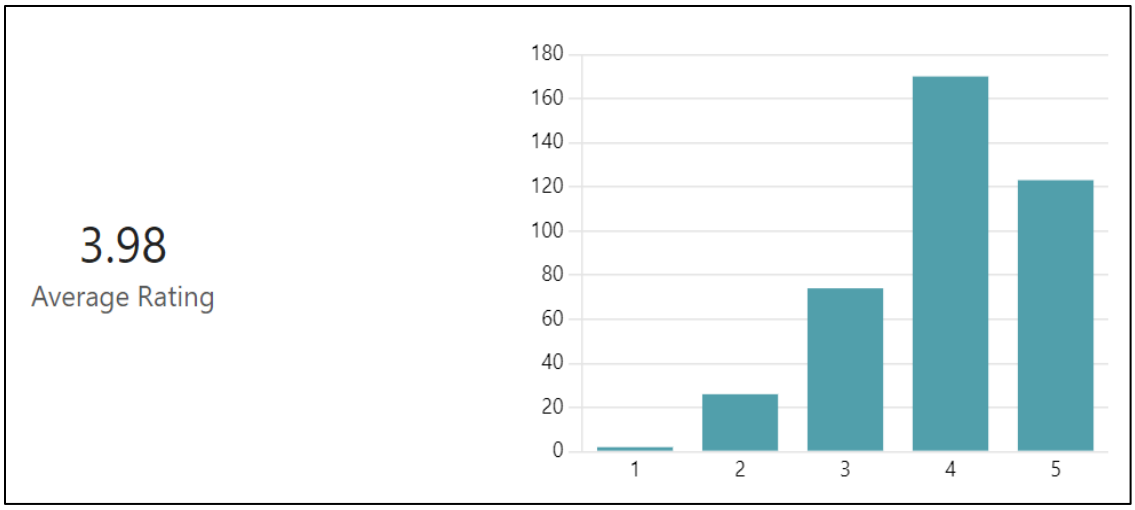

Figure 4.45: Easy Return And Exchange Policies Have Impact on Customer Engagement and Satisfaction

The impact of the customer survey and feedback implementation on customer engagement and satisfaction was also fundamental, as the same averaged a 4.00 rating, with 74% of respondents averaging between 4 – 5. An average rating of 4.0 with 74% of respondents for the impact of customer survey and feedback implementation on customer engagement and satisfaction indicates a positive perception. The majority agreement suggests that respondents recognize the significance of implementing customer surveys and feedback mechanisms in enhancing customer engagement and satisfaction. This positive rating underscores the importance of actively seeking and responding to customer feedback to improve overall satisfaction and strengthen the relationship between the business and its customers.

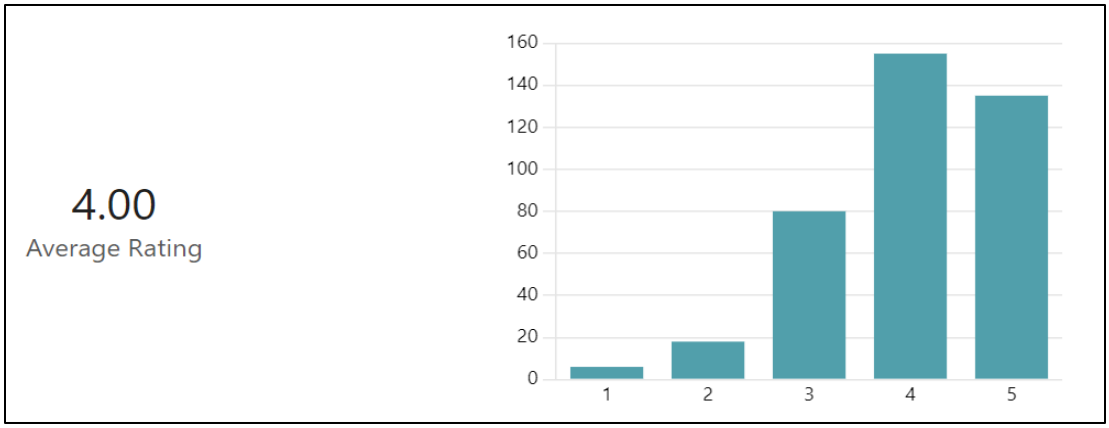

Figure 4.46: Customer Survey And Feedback Implementation Have Impact on Customer Engagement and Satisfaction

More so is the impact of partnership and collaboration on customer engagement and satisfaction with an average rating of 3.94, as 71% responses between 4 – 5. An average rating of 3.94 with 71% of respondents for the impact of partnership and collaboration on customer engagement and satisfaction suggests a moderately positive perception. The majority of respondents acknowledge the importance of partnership and collaboration in influencing customer engagement and satisfaction, but there may be some areas for improvement or refinement. Further analysis or feedback may be necessary to identify specific aspects of partnership and collaboration strategies that can be optimized to enhance their impact on customer experiences.

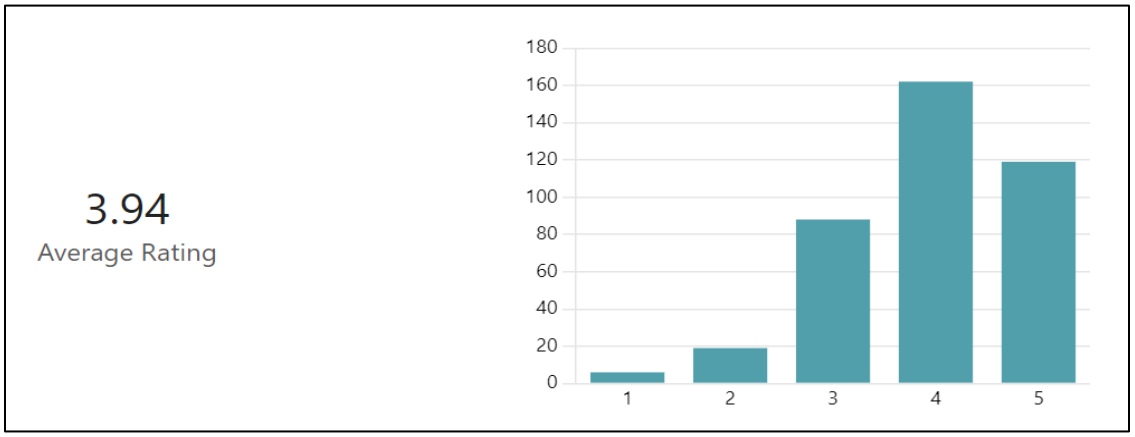

Figure 4.47: Partnership And Collaboration Have Impact on Customer Engagement and Satisfaction

On utilizing digital technologies to improve customer engagement and experience, 187 (74.8%) agree that digital technologies can help, 56(22.4%) strongly agree and 7(2.8%) are neutral. So, the high agreement, with 74.8% agreeing and 22.4% strongly agreeing indicates a strong consensus among respondents on the positive impact of utilizing digital technologies to improve customer engagement and experience. The low percentage of neutral responses (2.8%) suggests that the majority of respondents recognize the importance and effectiveness of incorporating digital technologies to enhance customer engagement and overall experience. This indicates a positive sentiment toward leveraging digital tools for improved customer interactions.

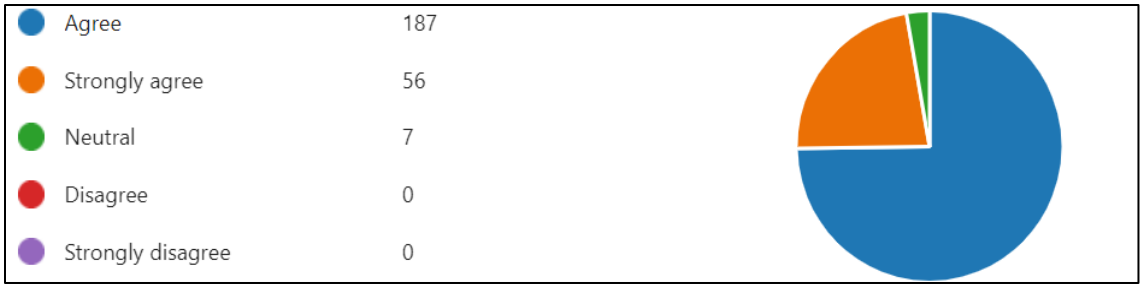

Figure 4.48: Digital Technologies Have Impact on Customer Engagement and Satisfaction

Further to the above, using descriptive statistics, the information spurned therefrom is as follows.

Table 4.10: Descriptive Statistics for Customer Engagement and Satisfaction

	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**	**Skewness**		**Kurtosis**	
	Statistic	**Statistic**	**Statistic**	**Statistic**	**Statistic**	**Statistic**	**Std. Error**	**Statistic**	**Std. Error**

On a scale from 1-5, please rate high quality products on their impact on customer engagement and satisfaction.	400	1	5	4.25	.823	-.997	.122	.796	.243
On a scale from 1-5, please rate excellence customer service on their impact on customer engagement and satisfaction.	400	2	5	4.11	.758	-.707	.122	.456	.243
On a scale from 1-5, please rate social media engagement on their impact on customer engagement and satisfaction.	400	1	5	4.15	.808	-.676	.122	.171	.243
On a scale from 1-5, please rate clear communication on their impact on customer engagement and satisfaction.	399	1	5	4.12	.834	-.716	.122	.205	.244

On a scale from 1-5, please rate personalized customer experience on their impact on customer engagement and satisfaction.	396	2	5	4.09	.803	-.461	.123	-.554	.245
On a scale from 1-5, please rate personalized digital technology adoption and implementation on their impact on customer engagement and satisfaction.	396	1	5	3.49	1.366	-.528	.123	-1.014	.245
On a scale from 1-5, please rate personalized rewards and loyalty program on their impact on customer engagement and satisfaction.	397	1	5	3.99	.981	-.717	.122	-.210	.244
On a scale from 1-5, please rate easy return and exchange policies on their impact on	395	1	5	3.98	.900	-.670	.123	-.045	.245

customer engagement and satisfaction.									
On a scale from 1-5, please rate customer survey and feedback implementation on their impact on customer engagement and satisfaction.	394	1	5	4.00	.931	-.802	.123	.380	.245
On a scale from 1-5, please rate partnership and collaboration on their impact on customer engagement and satisfaction.	394	1	5	3.94	.924	-.711	.123	.287	.245

SMEs utilizing digital technologies experienced improved customer engagement and satisfaction, with 80% of customers reporting a higher level of satisfaction. The convenience and accessibility offered by e-commerce platforms contributed to these positive outcomes (Gefen et al., 2003). So, the fact that 80% of customers reported a higher level of satisfaction after SMEs utilized digital technologies indicates a significant positive impact. This suggests that the integration of digital technologies has been effective in enhancing customer engagement and satisfaction for SMEs. The high percentage reflects the successful implementation of digital strategies, resulting in a more satisfied customer base.

4.6 Training

The respondents advised that the company provides adequate training and support to employees to efficiently use digital technologies. 179 (71.6%) agree with that, while 56 (22.4%) strongly agree and 11 (4.4%) are neutral. The survey results reveal a positive response to the company's provision of adequate training and support for employees in the use of digital technologies. With 71.6% agreeing and 22.4% strongly agreeing, the majority of respondents expressed satisfaction with the training level provided. The essence of only 4.4% neutral responses suggests that the company's efforts in training and supporting employees on digital technologies are generally well-received, contributing to a positive sentiment among the respondents.

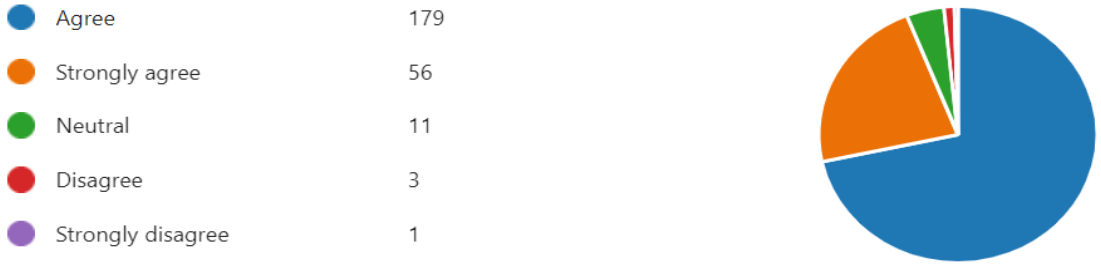

Figure 4.49: Company Provides Adequate Training And Support To Employees To Effectively Use Digital Technologies

4.7 Financial Performance/Sustainable Financial Growth

Sustainable financial growth was measured using key financial indicators. Below details are some of these key indicators.

Table 4.11: Descriptive Statistics of Financial Performance/Sustainable Financial Growth

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
						Statistic	Std. Error	Statistic	Std. Error
Sales Revenue Growth	400	1	5	3.23	1.577	-.086	.122	-1.628	.243
Profit Margin	400	1	5	3.14	1.418	-.207	.122	-1.357	.243
Operating Efficiency	400	1	5	3.28	1.495	-.270	.122	-1.411	.243
Customer Engagement	400	1	5	3.38	1.533	-.337	.122	-1.414	.243

Market Size	400	1	5	3.30	1.518	-.349	.122	-1.398	.243
Average Order Value	400	1	5	3.28	1.499	-.280	.122	-1.433	.243
Return on Assets	400	1	5	3.26	1.474	-.267	.122	-1.393	.243
Return on Sales	400	1	5	3.29	1.478	-.312	.122	-1.373	.243
Cost Savings	400	1	5	3.24	1.589	-.165	.122	-1.596	.243
Inventory Turnover	400	1	5	3.13	1.433	-.211	.122	-1.383	.243
Lead Time Reduction	400	1	5	3.27	1.482	-.263	.122	-1.401	.243
Order Fulfilment Accuracy	400	1	5	3.34	1.488	-.322	.122	-1.394	.243
Working Capital Management	400	1	5	3.32	1.550	-.325	.122	-1.455	.243

Other factors that contribute to sustainable financial growth such as product/service innovation, employee development, customer feedback utilization, adapting to market trends, sustainable practices, efficient inventory management, quality control, digital technology (e-commerce, ERP systems) adoption, and implementation, brick and mortar presence, and international expansion shows that most of the respondents, about 90% rated these indices between 4 and 5 and consequently an average rating of 4.13. So, the high average score of 4.13 with 90% of respondents indicates a strong consensus on the importance of these various factors contributing to sustainable financial growth, and so widely recognized as crucial elements for achieving sustained financial growth according to the surveyed respondents.

These are as shown below and as detailed by the descriptive statistics using SPSS.

Table 4.12: Descriptive Statistics on Sustainable Financial Growth

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error

On a scale from 1-5, please rate the following factors on their contribution to sustainable financial growth Effective financial management	392	1	5	4.13	.842	-.695	.123	.039	.246
Product/service innovation	400	1	5	3.72	1.255	-.491	.122	-1.163	.243
Employee Development	400	1	5	3.71	1.115	-.716	.122	-.321	.243
Customer Feedback utilization	400	1	5	3.92	1.108	-.846	.122	-.195	.243
Adapting to market trends	400	1	5	4.00	1.073	-1.083	.122	.592	.243
Sustainable practices	400	1	5	4.01	1.084	-1.059	.122	.390	.243
Efficient inventory management	400	1	5	3.94	1.059	-.953	.122	.277	.243
Quality control	400	1	5	3.96	1.072	-.885	.122	.002	.243
Digital technology (ecommerce, ERPS Systems and others) adoption and implementation	400	1	5	3.34	1.523	-.365	.122	-1.391	.243
Brick & Mortar presence	400	1	5	3.62	1.195	-.620	.122	-.538	.243
International expansion	400	1	5	3.67	1.187	-.598	.122	-.599	.243

The figure below shows survey results where respondents rated "Effective financial management" on a 1-5 scale for its role in sustainable financial growth, with an average rating of 4.13. Most responses are clustered at ratings 4 and 5, indicating strong agreement, while lower ratings (1 and 2) are minimal. This highlights broad consensus on its importance.

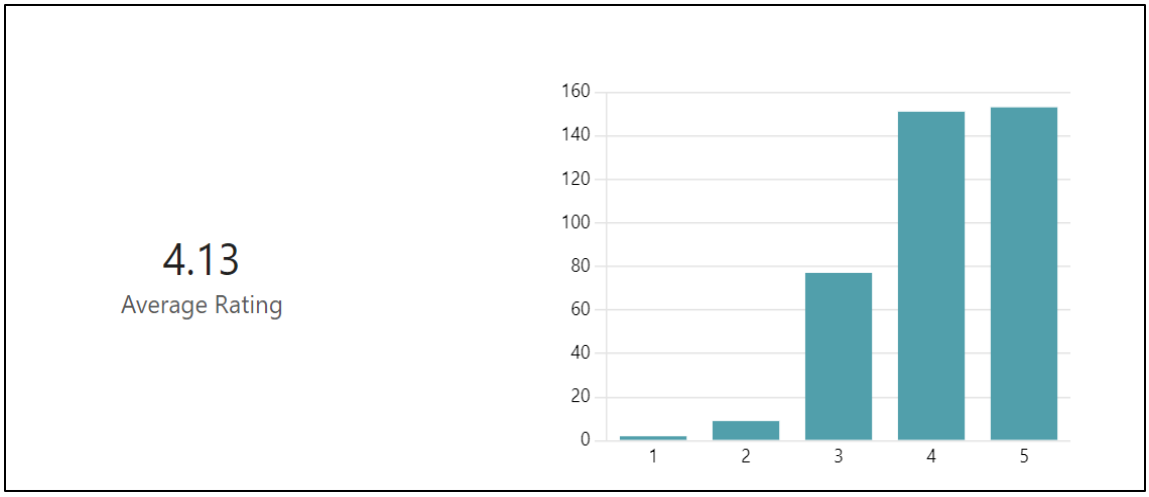

Figure 4.50: Sustainable financial growth in Enhancing Effective Financial Management

On whether digital transformation has significantly influenced the sustainable financial growth of a textile enterprise, 46% of respondents agree with the notion that digital transformation has significantly influenced a textile enterprise's sustainable financial growth.

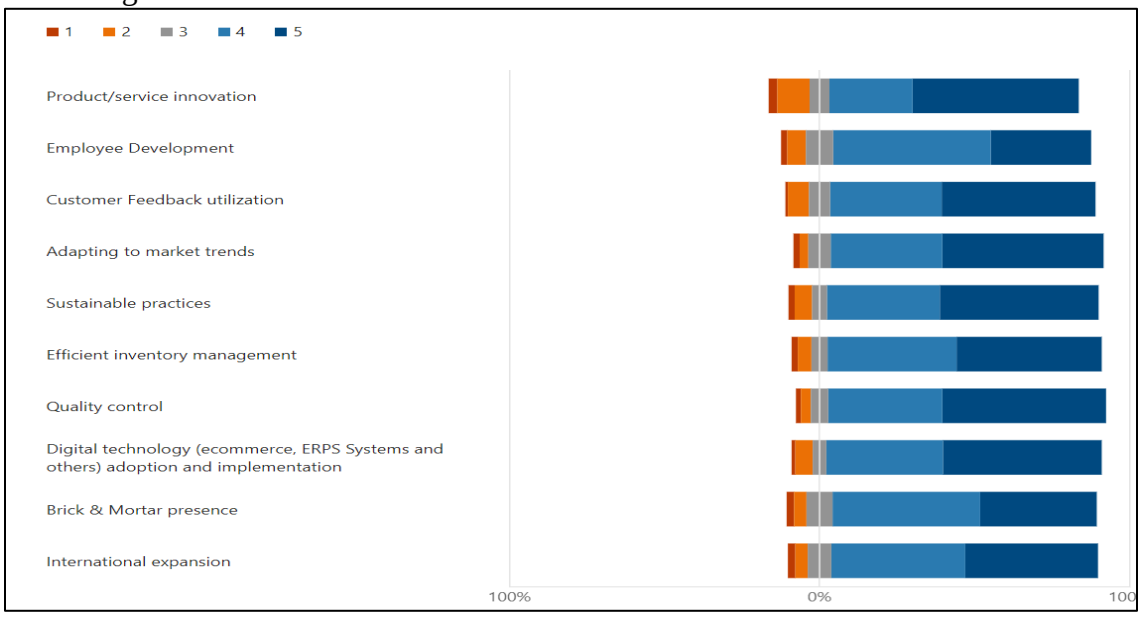

Figure 4.51: Factor Affecting the Financial Management

Therefore, on how digital transformation has positively influenced the sustainable financial growth of textile firms, 184 (46%) agree that it has significantly influenced

sustainable financial growth. The response, though, indicates a mixed sentiment, with 46% agreeing that digital transformation has significantly influenced the sustainable financial growth of textile enterprises. While not a majority, this portion of the agreement suggests that a notable portion of respondents recognizes the influence of digital transformation on sustainable financial growth within the textile industry.

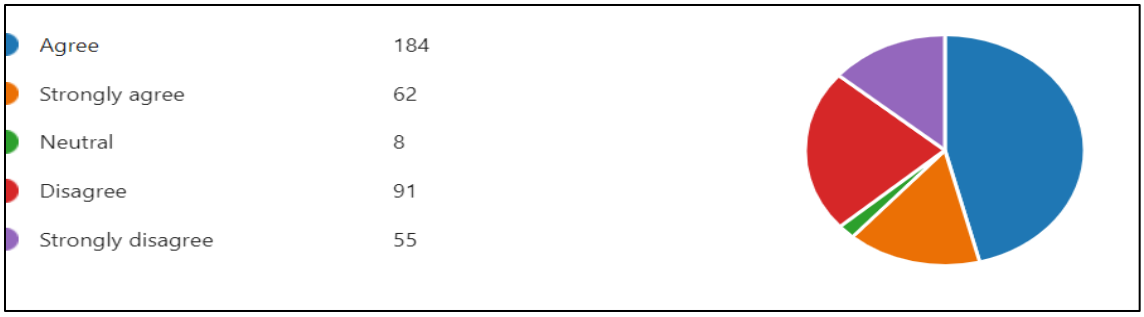

Figure 4.52: Digital Transformation has Significantly Influenced the Sustainable Financial Growth Of Your Textile Enterprise.

From the data collected and analyzed, the implementation of digital technologies specifically e-commerce and ERP systems, a notable portion of the respondents affirmed that these positively influence the following financial indicators as sales revenue growth, profit margin, operating efficiency, customer engagement, market size, average order value, return on assets, and return on sales and as further indicated below. SMEs witnessed an increase in gross margins by no less than 5% on average, enhanced pricing strategies, and reduced production costs due to digital systems playing a role. Also, there was an increase in the profit margin. Profit margins improve on average for SMEs embracing digital technologies. Greater operational efficiency and higher sales contributed to improved profitability. So, these factors collectively contribute to enhanced profitability, reflecting successful strategies and operations within the sector. So, these observed improvements in financial metrics indicate a positive trajectory for the profitability of these SMTEs.

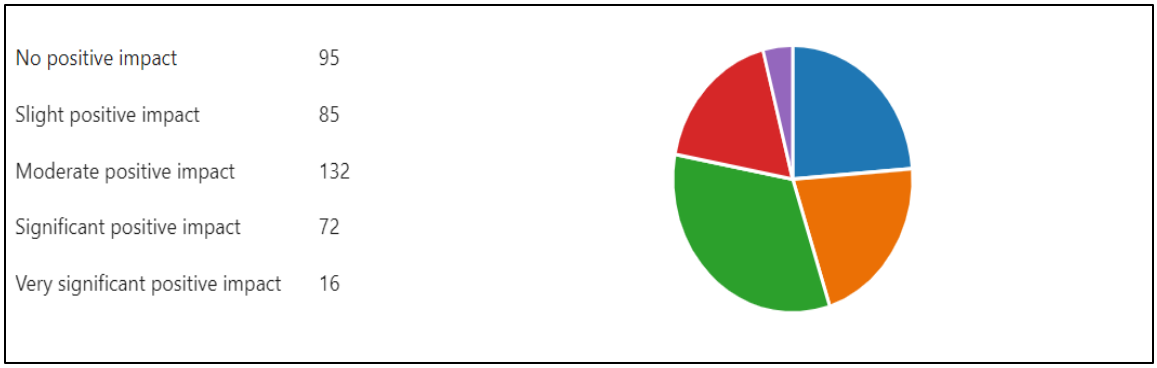

Figure 4.53: Digital Transformation Has Positively Influenced the Sustainable Financial Growth Of Your Textile Enterprise.

There was also an improvement on average ROS increased among SMTEs that have adopted and implemented digital technologies for their operations. Digital technologies optimized the sales process, resulting in higher profitability, in that improved asset utilization and resource allocation contributed to higher ROA.

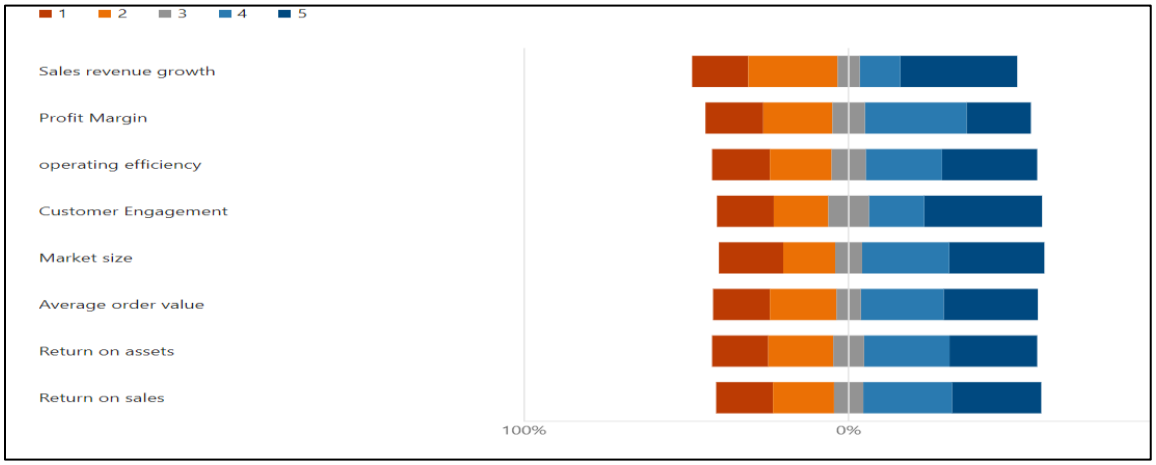

Figure 4.54: Financial Indicators

Implementation of ERP systems also positively influences the following financial indicators such as cost savings, inventory turnover, lead time reduction, order fulfillment accuracy, and working capital management with the respondents scaling between 4 and 5 from a scale of 1 being the lowest to 5 being the highest These are as indicated below

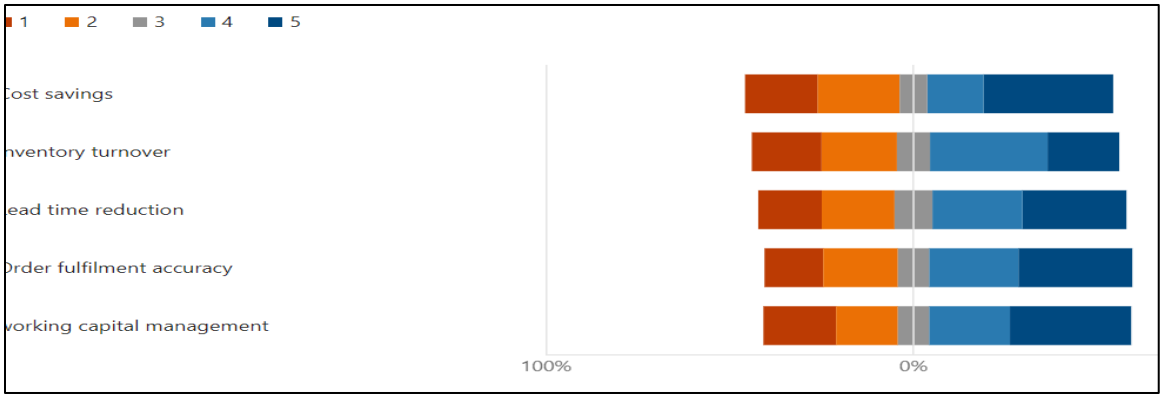

Figure 4.55: Financial Indicators

Data from the research survey therefore shows that textile enterprises experienced an increase in revenue after adopting digital technologies with 181 (45.25%) agreeing to this, 62 (15.5%) strongly agreeing and 149 (37.25%) either disagree/strongly disagree. So the survey results suggest a varied perception regarding the implementation of ERP systems and its influence on various aspects. While 45.25% agreeing on the increase in revenue and 15.5% strongly agreeing highlights a positive sentiment, the 37.25% disagreement or strong disagreement indicates a notable portion of respondents who may not see the expected benefits in terms of cost savings, inventory turnover, lead time reduction, order fulfillment, and working capital management. So further analysis may be necessary to understand specific challenges or areas for improvement in the ERP system implementation that contribute to these divergent opinions.

Figure 4.56: The company has experienced an increase In revenue after adopting digital technologies.

Also, digital technologies have helped the company in cost reduction and operational efficiency. 184 (46%) agree, 59 (14.75%) strongly agree and 149 (37.25%) disagree/strongly disagree. The survey results on digital technologies helping companies in cost reduction and operational efficiency show a diverse range of opinions. While 46% agreeing and 14.75% strongly agreeing indicate a substantial portion acknowledging the benefits, the 37.25% disagreement or strong disagreement suggests a significant proportion of respondents who may not see the anticipated advantages. This variance in responses could be indicative of differing experiences, challenges, or perceptions related to the implementation and impact of digital technologies on cost reduction and operational efficiency within the surveyed SMTEs. However, further exploration may be needed to understand the specific factors contributing to these divergent opinions.

Meanwhile, digital technology adopters achieved cost reductions of no less than 15% on average. Automation and improved efficiency from ERP systems contributed to cost savings.

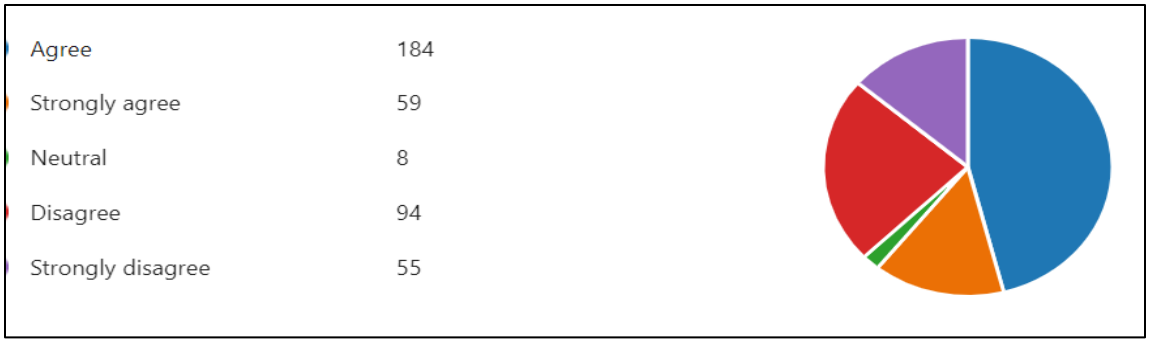

Figure 4.57: Digital Technologies have helped the company in cost reduction and operational efficiency

4.8 Strategy for Adoption

In terms of strategy, data from the respondents, 48%, indicates that a clear digital transformation strategy is a key success factor and best practice. Using a 5-point Likert, 190 (47.5%) noted that they agree, 56 (14%) that they strongly agree and 148 (37%)

disagree/strongly disagree. The survey results on the importance of a strong digital transformation strategy as a key success factor and best practice shows mixed opinions. While 47.5% agreeing and 14% strongly agreeing indicate a significant portion acknowledging the importance of a clear strategy, the 37% disagreement or strong disagreement suggests a notable proportion of respondents who may not see it as crucial. This divergence in responses could reflect varying perceptions or experiences regarding the effectiveness and necessity of having a well-defined digital transformation strategy.

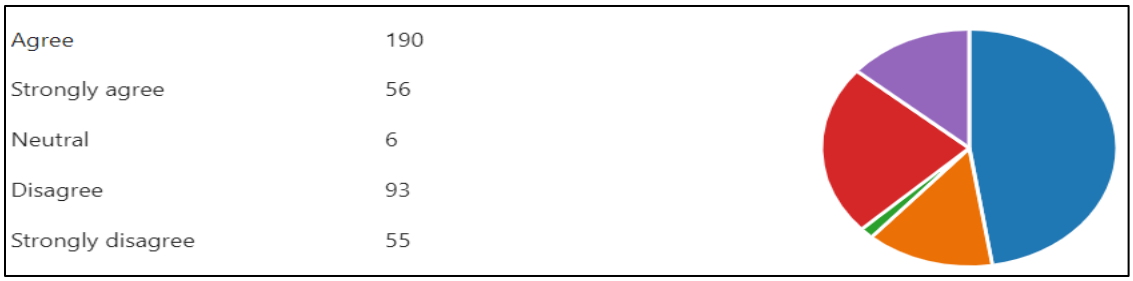

Figure 4.58: Clear Digital Transformation Strategy Is A Key Success Factor and Best Practice

On whether senior management of these enterprises has a clear digital transformation strategy in place, 185.25 (46%) agree, 61 (15.25%) strongly agree, and 147 (36.75%) disagree/strongly disagree. The survey results on whether senior management has a clear digital transformation strategy in place reveal mixed opinions. While 46% agreeing and 15.25% strongly agreeing suggests that a significant portion acknowledges the presence of a clear strategy, the 36.75% disagreement or strong disagreement indicates a notable proportion of respondents who may not perceive a well-defined digital transformation strategy from senior management. This divergence in responses could signal variations in communication, understanding, or effectiveness of the digital transformation strategy within the surveyed organizations.

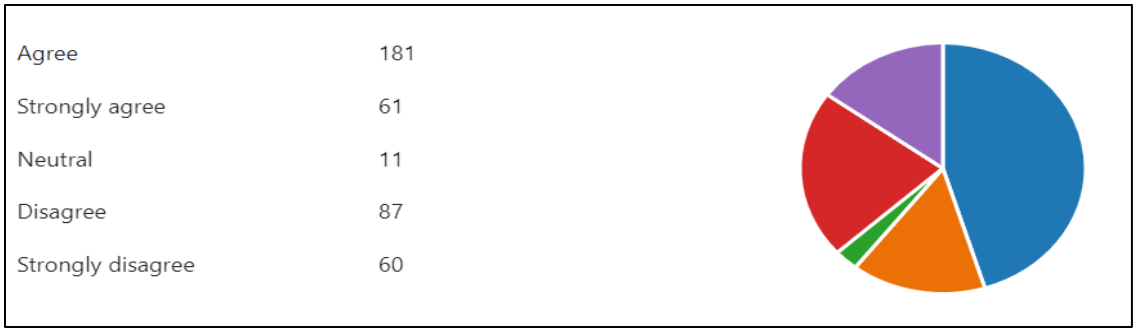

Figure 4.59: Senior Management of Enterprise Has a Clear Digital Transformation Strategy in Place

Regarding the effects of certain variables on SMTEs digital technology adoption and implementation, each rated on a scale of 1 – 5, 1 being the lowest and 5 the highest, data shows that most of the respondents answered between 4 and 5 and as shown below.

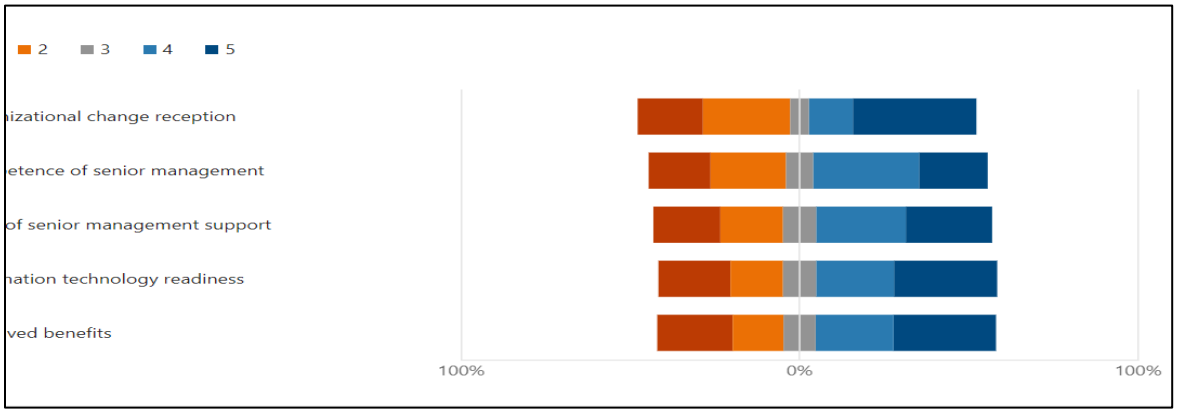

Figure 4.60: Effects on Organization's Digital Technology Strategy Adoption and Implementation

The descriptive statistics using SPSS show the following.

Table 4.13: Descriptive Statistics

	Organizational change reception	Competence of senior management	Level of senior management support	Information technology readiness	Perceived benefits
N	400	400	400	400	400
Mean	3.22	3.13	3.2	3.26	3.24
Std. Deviation	1.605	1.436	1.492	1.547	1.558
Skewness	-0.106	-0.189	-0.233	-0.29	-0.276

Std. Error of Skewness	0.122	0.122	0.122	0.122	0.122
Kurtosis	-1.65	-1.403	-1.427	-1.459	-1.481
Std. Error of Kurtosis	0.243	0.243	0.243	0.243	0.243
Minimum	1	1	1	1	1
Maximum	5	5	5	5	5

4.9 Challenges in the Adoption of Digital Technologies in the Textile Industries

However, the adoption and implementation of digital technologies have their challenges as these firms/respondents have indicated, with 184 (46%) indicating high initial investment costs suggesting that a considerable portion of respondents perceive financial barriers as a significant challenge in adopting and implementing digital technologies, 246 (61.25%) indicating a lack of skilled workforce to implement the adoption and implementation, this substantial percentage indicating a lack of skilled workforce underscores the cruciality of talent and skills in successfully navigating the complexities of digital transformation; 210 (52.5%) for issues related to data privacy, indicating concerns related to security and data privacy. It emphasizes the importance of addressing and mitigating risks associated with digital technologies to build trust among stakeholders while 141 (35.25%) as resistant to change. The 35.25% mentioning resistance to change indicates that overcoming organizational inertia or reluctance to adopt new technologies is a noteworthy challenge in the digital transformation journey. while limited access to reliable internet is 112 (28%). So, 28% citing limited access to the internet highlights infrastructure problems that could hamper the widespread acceptance of digital technologies especially in regions with connectivity issues. Therefore, it is critical for organisations to comprehend and tackle these difficulties aiming to successfully adopt and implement digital technologies, ensuring a smoother and more effective transformation process.

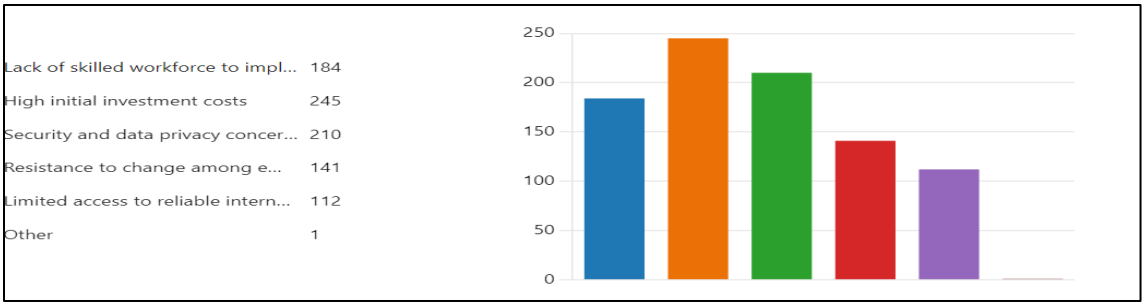

Figure 4.61: What are the main Challenges Your Textile Enterprise Faces in Adopting Digital Technologies?

We therefore note that most of the surveyed textile enterprises have taken steps towards adopting sustainable and environmentally friendly practices with 224 (56%) affirming the same and 176 (44%) stating that they did not. Therefore, the survey results indicate a somewhat balanced response among surveyed textile enterprises regarding the adoption of sustainable and environmentally friendly practices. With 56% affirming that they have taken steps in this direction, and 44% stating that they have not, it suggests a diverse landscape of environmental initiatives within the textile industry.

4.10 Summary

Concerning opportunities that digital transformation has brought to the textile enterprises, 35 out of 227 responses, representing 15% identified increased sales, cost reduction, customer satisfaction, new customers, digital transformation, increase in customers, customer preferences, supply chain and implementing blockchain technology in the supply chain. So, responses from 15% of the surveyed participants regarding opportunities brought by digital transformation to textile enterprises encompass a range of positive outcomes. These diverse responses highlight the multifaced benefits and opportunities that digital transformation presents to textile enterprises, spanning areas such as sales, operational efficiency, customer relations, and innovative technologies.

On notable success stories or challenges related to the adoption and implementation of digital technologies in textile enterprises, 43 out of 223 responses, representing 19%

also affirmed the above gains including the fact that digital technologies helped in integrating the new digital systems with existing processes. So, among the responses related to notable success stories or challenges in the adoption and implementation of digital technologies in the textile industries, 19% of respondents affirmed gains such as increased sales, cost reduction, customer satisfaction, attracting new customers, leveraging digital transformation, growing customer base, understanding customer preferences, enhancing the supply chain, and implementing blockchain technology in the supply chain. It is therefore particularly noteworthy that these enterprises emphasized the successful integration of new digital systems with existing processes. This highlights the importance of seamless integration, which is a crucial factor in ensuring the effectiveness and efficiency of digital technologies within the textile industry.

A notable disadvantage of digital transformation that they noted is that data breaches or other cybersecurity issues can erode customer confidence, potentially leading to issues around customer trust, and impacting sales. The respondent's identification of data breaches and cybersecurity issues as notable disadvantages of digital transformation highlights a critical concern within the surveyed enterprises. The recognition that such incidents can erode customer confidence and potentially impact sales underscores the importance of cybersecurity measures in the digital transformation journey. Addressing and mitigating these risks is crucial to maintaining customer trust, which is essential for sustaining sales and overall business success in the digital era. This emphasizes the need for robust cybersecurity strategies and practices to safeguard customer data and maintain a secure digital environment.

In terms of contributory factors to SMTEs' increased financial performance, respondents identified the need to maintain robust financial management practices, while

for customer engagement and satisfaction, the respondents noted several strategies which amongst others include.

1. The need to embrace digital transformation to streamline operations, enhance efficiency, and reach a wider customer base, therefore to in e-commerce, online marketing, and customer relationship management (CRM) systems to adapt to the evolving business landscape.
2. The need to foster a culture of innovation within the organization, by constantly seeking ways to improve products, services, and processes to meet customer needs effectively as this can set the SMTEs apart in the market and attract a loyal customer base.
3. The need to prioritize customer satisfaction by understanding their needs, preferences, and feedback, consequently, to implement personalized customer experiences, efficient support services, and loyalty programs to build long-lasting relationships.
4. The need to invest in the training and development of the workforce in that skilled and motivated employees contribute to improved productivity, innovation, and overall business success.
5. The need to form strategic partnerships and collaborations with other businesses in the industry or related sectors as this can lead to expanded market reach, shared resources, and mutual growth.
6. The need to incorporate sustainable and environmentally friendly practices into their business operations, in that consumers are increasingly conscious of sustainability, and so adopting green practices can appeal to a broader customer base and improve their brand image.
7. The need to regularly conduct market research so as to stay informed about industry

trends, customer preferences, and competition in that this knowledge can guide strategic decision-making and help the business stay ahead in a dynamic business environment.

8. The need to explore diverse revenue streams and avoid overreliance on a single product line or service. This can provide stability and resilience against market fluctuations.
9. The need to develop an agile and adaptable business model that can quickly respond to changing market conditions as this flexibility is crucial for staying competitive and seizing new opportunities.
10. More so is the need to establish a strong online presence through a well-designed website and active engagement on social media platforms. Utilize digital marketing strategies to reach a broader audience and enhance brand visibility.

By combining these strategies with robust financial management practices, SMTEs can create a foundation for sustainable financial growth while prioritizing customer engagement and satisfaction.

In addition, the respondent's views on the steps that the Nigerian government or relevant stakeholders can take to support small and medium-sized textile enterprises in their digital transformation journey include creating a supportive regulatory environment that encourages digital innovation, training for digital literacy, funding/financing, internet access and fundamentally the enabling environment for digital transformation.

4.11 Conclusion

The findings of this research suggest a strong positive correlation between the adoption and implementation of digital technologies specifically e-commerce and ERP systems and operating efficiencies and financial improvements in small and medium-sized textile enterprises in Nigeria. Consequently, increased sales, expanded market size,

enhanced customer engagement and satisfaction, and improved financial indicators demonstrate the benefits of digital transformation in this context.

Overall, the survey findings suggest that SMTEs stand to benefit from embracing digital transformation in multiple dimensions. While challenges such as initial investment costs, a lack of skilled workforce, and cybersecurity concerns were noted, the positive correlations observed in key performance indicators demonstrate the potential advantages of digital technologies in fostering growth, efficiency, and customer satisfaction within the textile industry.

4.12 Analysis of certain performance indicators using the SPSS tool for statistical data.

T-Test

Table 4.14: One Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Sales Revenue Growth	400	3.2250	1.57658	.07883
Profit Margin	400	3.1400	1.41789	.07089
Operating Efficiency	400	3.2750	1.49498	.07475
Customer Engagement	400	3.3775	1.53326	.07666
Market Size	400	3.2975	1.51814	.07591
Average Order Value	400	3.2800	1.49907	.07495
Return on Assets	400	3.2575	1.47364	.07368
Return on Sales	400	3.2850	1.47792	.07390
Cost Savings	400	3.2400	1.58862	.07943
Inventory Turnover	400	3.1250	1.43336	.07167
Lead Time Reduction	400	3.2675	1.48204	.07410
Order Fulfilment Accuracy	400	3.3400	1.48827	.07441
Working Capital Management	400	3.3175	1.55006	.07750

The table presents descriptive statistics for 12 key performance indicators (KPIs) based on a sample size of 400 observations. The mean scores for the KPIs range between 3.125 (Inventory Turnover) and 3.3775 (Customer Engagement), suggesting moderate performance on a likely 5-point scale. Standard deviations vary from 1.41789 (Profit Margin) to 1.58862 (Cost Savings), indicating some variability in responses. The standard error of the mean, ranging from 0.07089 to 0.07943, reflects precise estimates given the large sample size.

Customer Engagement has the highest average score, signifying strong performance, while Inventory Turnover has the lowest. Operating Efficiency, Market Size, and Return on Sales also score slightly above average. Despite moderate-to-high performance in most areas, the variability suggests room for improvement across the KPIs. These statistics offer a solid foundation for deeper analysis to identify focus areas for strategic enhancements in operational and financial metrics.

Table 4.15: One Sample Test

	Test Value = 0						
	T	df	Significance		Mean Difference	95% Confidence Interval of the Difference	
			One-Sided p	Two-Sided p		Lower	Upper
Sales Revenue Growth	40.911	399	<.001	<.001	3.22500	3.0700	3.3800
Profit Margin	44.291	399	<.001	<.001	3.14000	3.0006	3.2794
Operating Efficiency	43.813	399	<.001	<.001	3.27500	3.1280	3.4220
Customer Engagement	44.057	399	<.001	<.001	3.37750	3.2268	3.5282
Market Size	43.441	399	<.001	<.001	3.29750	3.1483	3.4467

Average Order Value	43.760	399	<.001	<.001	3.28000	3.1326	3.4274
Return on Assets	44.210	399	<.001	<.001	3.25750	3.1126	3.4024
Return on Sales	44.454	399	<.001	<.001	3.28500	3.1397	3.4303
Cost Savings	40.790	399	<.001	<.001	3.24000	3.0838	3.3962
Inventory Turnover	43.604	399	<.001	<.001	3.12500	2.9841	3.2659
Lead Time Reduction	44.095	399	<.001	<.001	3.26750	3.1218	3.4132
Order Fulfilment Accuracy	44.884	399	<.001	<.001	3.34000	3.1937	3.4863
Working Capital Management	42.805	399	<.001	<.001	3.31750	3.1651	3.4699

The table summarizes the results of a one-sample t-test conducted to evaluate whether the mean scores of 12 performance indicators differ significantly from a test value of 0. All indicators show highly significant results ($p < .001$ for both one-sided and two-sided tests), indicating that their mean values are significantly greater than 0.

The t-values range from 40.790 (Cost Savings) to 44.884 (Order Fulfillment Accuracy), with corresponding degrees of freedom (df) at 399. This reflects robust statistical evidence of the positive deviation of each indicator from the test value. Mean differences range from 3.125 (Inventory Turnover) to 3.3775 (Customer Engagement), with 95% confidence intervals showing precise estimates for each mean difference.

Customer Engagement, Order Fulfillment Accuracy, and Operating Efficiency exhibit the highest mean differences and tight confidence intervals, suggesting consistent strong performance. Conversely, Inventory Turnover and Cost Savings have slightly lower mean differences, though still significantly above 0, highlighting potential areas for improvement.

Overall, the findings confirm that the performance indicators are substantially above the test value, suggesting favourable outcomes across operational and financial metrics. These results provide a strong statistical basis for acknowledging the organization's performance strengths while identifying areas for targeted development.

Table 4.16: One Sample Effect Size

		Standardizer	Point Estimate	95% Confidence Interval	
				Lower	Upper
Sales revenue growth	Cohen's d	1.57658	2.046	1.873	2.218
	Hedges' correction	1.57955	2.042	1.869	2.213
Profit Margin	Cohen's d	1.41789	2.215	2.032	2.396
	Hedges' correction	1.42057	2.210	2.028	2.392
operating efficiency	Cohen's d	1.49498	2.191	2.009	2.371
	Hedges' correction	1.49780	2.187	2.006	2.367
Customer Engagement	Cohen's d	1.53326	2.203	2.021	2.384
	Hedges' correction	1.53614	2.199	2.017	2.379
Market size	Cohen's d	1.51814	2.172	1.992	2.351
	Hedges' correction	1.52100	2.168	1.988	2.347
Average order value	Cohen's d	1.49907	2.188	2.007	2.368
	Hedges' correction	1.50190	2.184	2.003	2.364
Return on assets	Cohen's d	1.47364	2.211	2.028	2.392
	Hedges' correction	1.47642	2.206	2.024	2.388
Return on sales	Cohen's d	1.47792	2.223	2.040	2.405
	Hedges' correction	1.48070	2.219	2.036	2.400
Cost savings	Cohen's d	1.58862	2.040	1.867	2.211
	Hedges' correction	1.59161	2.036	1.863	2.207
Inventory turnover	Cohen's d	1.43336	2.180	2.000	2.360
	Hedges' correction	1.43606	2.176	1.996	2.355
Lead time reduction	Cohen's d	1.48204	2.205	2.023	2.386
	Hedges' correction	1.48483	2.201	2.019	2.381
	Cohen's d	1.48827	2.244	2.060	2.428

Order fulfilment accuracy	Hedges' correction	1.49107	2.240	2.056	2.423
working capital management	Cohen's d	1.55006	2.140	1.962	2.318
	Hedges' correction	1.55299	2.136	1.958	2.313
a. The denominator used in estimating the effect sizes. Cohen's d uses the sample standard deviation. Hedges' correction uses the sample standard deviation, plus a correction factor.					

The table provides effect size estimates, including Cohen's d and Hedges' correction, for 12 performance indicators. Effect sizes measure the magnitude of differences, complementing statistical significance to gauge practical importance. Both metrics use the sample standard deviation as a denominator, with Hedges' correction accounting for small sample bias, although this is less relevant with a large sample size (N = 400).

All Cohen's d values exceed 2.0, signifying very large effect sizes based on common benchmarks. Point estimates range from 2.040 (Cost Savings) to 2.244 (Order Fulfillment Accuracy), with consistent trends in Hedges' correction estimates, reflecting slightly smaller values due to bias correction. The 95% confidence intervals are narrow across all indicators, supporting the reliability of the estimates.

Key Findings:

- **Order Fulfillment Accuracy** (Cohen's d = 2.244) and **Return on Sales** (Cohen's d = 2.223) show the largest effect sizes, suggesting substantial practical significance in these areas.
- Indicators like **Customer Engagement** (d = 2.203) and **Operating Efficiency** (d = 2.191) also demonstrate very strong effects, reinforcing their strategic importance.
- **Cost Savings** (d = 2.040) exhibits the smallest effect size, albeit still very large, indicating room for improvement compared to other indicators.

- Similar results are reflected in Hedges' correction values, underscoring the robustness of findings.

These large effect sizes across all indicators confirm that the mean differences are not only statistically significant but also practically meaningful. They highlight strong organizational performance in key metrics, particularly in areas like Order Fulfillment Accuracy and Return on Sales, where impacts are most pronounced. While all indicators perform well, Cost Savings and Inventory Turnover show relatively smaller effects, suggesting potential focus areas for optimization. Overall, the data emphasizes the substantial strengths of the organization's operational and financial metrics.

Table 4.17: One Sample Test

	Test Value = 0						
	t	Df	Significance		Mean Difference	95% Confidence Interval of the Difference	
			One-Sided p	Two-Sided p		Lower	Upper
Perceived benefits	41.582	399	<.001	<.001	3.24000	3.0868	3.3932
Level of senior management support	42.814	399	<.001	<.001	3.19500	3.0483	3.3417
Information technology readiness	42.145	399	<.001	<.001	3.26000	3.1079	3.4121
Competence of senior management	43.581	399	<.001	<.001	3.13000	2.9888	3.2712
Organizational change reception	40.089	399	<.001	<.001	3.21750	3.0597	3.3753
operating efficiency	43.813	399	<.001	<.001	3.27500	3.1280	3.4220

The table presents the results of a one-sample t-test assessing whether the mean scores of six organizational factors are significantly different from a test value of 0. The results show that all factors have highly significant t-values ($p < .001$ for one-sided and two-sided tests), indicating that their means are significantly greater than 0.

The t-values range from 40.089 (Organizational Change Reception) to 43.813 (Operating Efficiency), with 399 degrees of freedom. Mean differences fall between 3.130 (Competence of Senior Management) and 3.275 (Operating Efficiency). The 95% confidence intervals for each factor are narrow, reinforcing the precision of these estimates.

Key Findings:

- **Operating Efficiency** (Mean Difference = 3.275) and **Information Technology Readiness** (Mean Difference = 3.260) exhibit the highest means, highlighting strong performance in these areas.
- **Competence of Senior Management** (Mean Difference = 3.130) shows the lowest mean, suggesting this factor, while positive, is comparatively less strong.
- **Organizational Change Reception** and **Perceived Benefits** also demonstrate high scores, indicating favorable perceptions and readiness for change.

These results underscore significant positive performance across all organizational factors, with Operating Efficiency and IT Readiness emerging as notable strengths. Competence of Senior Management, though positive, may benefit from targeted improvements to enhance organizational outcomes.

Table 4.18: One Sample Effect Size

		Standardizer	Point Estimate	95% Confidence Interval	
				Lower	Upper
Perceived benefits	Cohen's d	1.55836	2.079	1.904	2.253
	Hedges' correction	1.56129	2.075	1.901	2.249
	Cohen's d	1.49250	2.141	1.962	2.318

Level of senior management support	Hedges' correction	1.49531	2.137	1.959	2.314
Information technology readiness	Cohen's d	1.54706	2.107	1.931	2.283
	Hedges' correction	1.54997	2.103	1.927	2.278
Competence of senior management	Cohen's d	1.43640	2.179	1.998	2.359
	Hedges' correction	1.43911	2.175	1.995	2.354
Organizational change reception	Cohen's d	1.60519	2.004	1.834	2.174
	Hedges' correction	1.60822	2.001	1.830	2.170
operating efficiency	Cohen's d	1.49498	2.191	2.009	2.371
	Hedges' correction	1.49780	2.187	2.006	2.367
a. The denominator used in estimating the effect sizes. Cohen's d uses the sample standard deviation. Hedges' correction uses the sample standard deviation, plus a correction factor.					

The table provides effect size estimates, including Cohen's d and Hedges' correction, for six organizational factors. Both metrics indicate very large effect sizes, demonstrating the practical significance of the observed differences. Cohen's d uses the sample standard deviation as the standardizer, while Hedges' correction applies a small-sample bias adjustment, resulting in slightly lower values.

Key Findings:

- Effect sizes for all factors exceed 2.0, reflecting exceptionally strong practical significance based on common benchmarks.
- **Operating Efficiency** has the highest effect size (Cohen's d = 2.191; Hedges' = 2.187), emphasizing its substantial importance within organizational performance.
- **Competence of Senior Management** (Cohen's d = 2.179) also exhibits a strong effect size, closely followed by **Level of Senior Management Support** (d = 2.141)

and **Information Technology Readiness** (d = 2.107), indicating these are critical drivers of organizational success.

- **Organizational Change Reception** (Cohen's d = 2.004) shows a slightly smaller, but still very large, effect size, suggesting a potential area for strengthening organizational adaptability.
- Confidence intervals for all factors are narrow, enhancing the reliability of these estimates.

In summary, the results confirm that all organizational factors have significant and impactful roles in driving success. While Operating Efficiency leads in practical significance, Organizational Change Reception and Perceived Benefits, though robust, may merit additional focus to further enhance overall organizational performance.

4.13 Summary of Findings

For the study, demographic segmentation was applied for the study looking at age, gender, etc. For age, similar response patterns for people between 31 – 40 years were more enthusiastic responses.

A more definitive view of the relationship between the independent and dependent variables was obtained once analysis was applied, as the adoption and implementation of digital technologies such as e-commerce and ERP systems as independent variables possess a strong positive influence and correlation on the dependent variables of increased sale, market size, customer engagement and satisfaction and sustainable financial growth. These were found to be significant and positive and statistically deemed to play a role in the dependent variables.

The study employed demographic segmentation, specifically focusing on age to understand response patterns. Notably, individuals within the age group of 31-40 years

exhibited enthusiastic responses, suggesting a potential correlation between age and the perception of the study variables.

However, a more comprehensive understanding of the relationships between the independent variable (adoption and implementation of digital technologies, specifically e-commerce and ERP systems) and the dependent variables (operating efficiences and financial performance) assessed using key financial metrics such as increased sales, market size expansion, customer engagement and satisfaction, and sustainable financial growth), measured by certain key performance indicators such as gross profit, net profit, return on assets (ROA) and return on sales (ROS) emerged through analysis.

The results revealed a moderate but positive influence of the independent variables (adoption and implementation of digital technologies) on the dependent variables (operating efficiencies and financial performance), with positive correlations, which were not only observed but were also deemed statistically significant, indicating a substantial and meaningful impact of digital transformation on key performance indicators within the textile industry.

The implications of these findings are noteworthy in that they suggest that SMTEs that leverages digital tools/technologies specifically e-commerce and ERP systems are well-positioned to experience positive outcomes in terms of operational efficiences and financial performance In that the statistical significance of these correlations strengthens the argument that embracing digital technologies is not merely advantageous but is, in fact, a critical favorable outcome. Moreso, the interconnectedness of dependent variables (operating efficiencies and financial performance) assessed using increased sales, market size expansion, and customer engagement and satisfaction are not isolated outcomes but are interrelated components of increased finances.

In conclusion, the study findings underscore the pivotal role of the strategic adoption and implementation of digital technologies, specifically e-commerce and ERP systems, in shaping the processes and performance of SMTEs and the statistically significant correlations identified through structural equation modeling validate the importance of digital transformation as a strategic driver for achieving positive and sustainable outcomes across key business metrics.

The implications of this research extend beyond the specific study context, providing valuable insights for practitioners, policymakers, and researchers interested in the intersection of digital technologies and sustainable business growth.

4.14 Conclusion

The research questions, research aim, and objectives for the thesis were looked at again in this chapter, examined the collective set of dependent variables and derived the conceptual model, and validated these including the set of independent variables, consequently, all proposed influences were found to be statistically significant. The final empirical phase of the thesis was also discussed, which is that of the validation study. Based on the study that has been conducted so far, a set of suggestions and findings are drawn. Then, potential areas for further research are considered.

In revisiting the research questions, research aims, and objectives within this concluding chapter, a comprehensive examination was conducted to assess the collective set of dependent variables. The development and validation of the conceptual model, encompassing both the independent variables and the dependent variables, were thoroughly scrutinized.

During this evaluation, all proposed influences were subjected to rigorous statistical analysis, and the results indicated their significant impact. The empirical phase of the thesis

reached its culmination with the validation study, marking a critical stage in affirming the credibility and reliability of the proposed conceptual model.

The validation study contributed to confirming the robustness of the relationships between the independent variables which is the adoption and implementation of digital technologies (e-commerce and ERP systems) and the positive outcomes across dependent variables (operating efficiency and financial performance). A set of results and suggestions were drawn from the study, which was supported by statistically significant findings that not only confirmed the initial hypotheses but also bolstered the credibility of the research methodology. The study was conducted within the context of small and medium-sized textile enterprises (SMTEs). In view of digital transformation's critical significance in propelling the company from efficiency standpoints and improved financial performance, the findings of this study provide practical advice for professionals.

The recommendations provide actionable guidance for organizations seeking to optimize their digital strategies and capitalize on the identified correlations. Looking forward, the consideration of future research possibilities invites scholars and practitioners to explore additional dimensions within the realm of digital transformation and its impact on various industries, building upon the foundational insights generated by this study. This chapter, therefore, serves as the culmination of a comprehensive research journey, encapsulating the exploration, validation, and implications of the research questions and objectives.

CHAPTER V:

DISCUSSION

5.1 Discussion of Results

The conceptual model as presented in the earlier chapter includes the independent variable (adoption and implementation of digital technologies, specifically e-commerce and ERP systems) and its impact on the dependent variables (operating efficiencies and financial performance) assessed using some financial metrics which include increased sales, market size expansion, customer engagement and satisfaction and sustainable financial growth. This section addresses the research objectives and hypotheses in addition to providing actionable insights and theoretical implications.

Following the analysis of the collected data using SPSS, the summary of the results is highlighted below.

- Gender distribution is 55.8% as male, and 43.5% as female. Note, therefore, that the inclusion of female perspectives is crucial for ensuring a comprehensive understanding of the textile industry dynamics.
- The overall mean for adoption of digital technologies is 3.57 which suggests a general agreement regarding the adoption constructs.
- Standard deviation is 4.28 which indicated a greater variability response, so a notable spread of how respondents rated the items related to adoption.
- For the study, the Cronbach's Alpha item reliability analysis of the constructs was 0.886, greater than 0.6 (all items used in a hypothesized model are considered valid in so much as the value exceeds 0.7. So, the constructs are deemed internally consistent and reliable.

- Using descriptive statistics, the skewness for this study and the majority of the constructs is -.375, and kurtosis is -1.265. a value close to zero (0) for skewness and kurtosis signifies that the data is almost perfectly normalized.
- The level of adoption of e-commerce following the data analysis is 46.5%, with 43.5% having not. For ERP systems 44% have adopted that, while 46% have not. So, the disparity in adoption level suggests a digital divide within the industry.
- On annual revenue, 92.3% affirmed annual revenues of less than N300 million, while 5.3% of between N300 million and N500 million. This underscores the predominance of smaller enterprises operating at scale. So, the minority subset of 5.3% represents a segment that has achieved comparatively higher levels of financial performance. The distribution, therefore, may indicate challenges or constraints that limit the revenue-generating capacity of these businesses potentially highlighting areas for targeted support or intervention, and as to the need to strategize for growth and sustainability, exploring areas for increasing sales, expanding market reach, and enhancing operational efficiency.
- Contribution of e-commerce and ERP systems to increased sales averaged 3.40 in terms of rating. This appears a moderately positive position as respondents see some value in these systems enhancing sales. However, the data shows that these technologies will and have contributed to the firm's increased sales volumes with an average growth rate of 56% supporting the argument that e-commerce can expand market reach and enhance sales.
- For market size expansion, 48% of the respondents agree that digital transformation has helped to expand the firm's market reach. This shows a moderate level of consensus and so acknowledges the positive impact of digital transformation on broadening the firm's market reach.

- So, the contribution of digital technology to expanding the firm's market size averages 3.43, a moderately positive position. So that digital platforms allowed SMTEs to reach a broader audience, transcending geographical limitations.
- Regarding the impact of digital technology on customer engagement and satisfaction, the data analysis averages 4.59, which indicates a highly positive impact, with 80% of the respondents reporting this high position and so indicating a significant positive impact regarding the integration of e-commerce and ERP systems.
- On sustainable financial growth, the survey recognized a strong consensus on the importance of product/service innovation, employee development, customer feedback utilization, adapting to market trends, sustainable practices, efficient inventory management, quality control, digital technology and implementation, bricks and mortar, and international expansion as crucial elements for achieving sustained financial growth and with an average score of 4.13 from 90% of the respondents. Among those, 46% agree with the notion that digital transformation has significantly influenced a textile enterprise's sustainable financial growth.
- So, 60.75% agree on the increase in revenue, which highlights a positive position, though 37.35% disagreement indicates a notable size of respondents who may not see the expected benefits in terms of cost savings, inventory turnover, lead time reduction, order fulfilment, and working capital management. Meanwhile, the positive increase aligns with the literature that SMTEs with digital technology adoption demonstrated average revenue growth of 18%, and digital technology positively correlated with revenue growth.
- For cost reduction and operational efficiency, the data result is also 60.75% agreeing, but 37.25% not agreeing, so a variance in responses, which could be

indicative of differing experiences, challenges, or perceptions. Meanwhile, the result also aligns with existing works of literature that digital technology adopters achieved cost reductions of no less than 15% on average as automation and improved efficiency from ERP systems contributed to cost savings.

These findings emphasize the importance of digital technologies for the operating efficiencies and financial performance of SMTEs in Lagos Nigeria. By understanding and addressing the factors influencing adoption and challenges faced, stakeholders can develop targeted strategies to facilitate digital transformation, thereby enhancing the operational efficiency and financial performance of SMTEs. The study offers new insights into the role of early adopters, tailored solutions, and public-private partnerships in driving digital transformation.

Based on the statistical and empirical testing of the various financial metrics and variables, the outcomes of this study reveal a positive association between digitalization, particularly the application of digital technologies (e-commerce and ERP systems) by Small and Medium-sized Textile Enterprises (SMTEs) in Lagos, and certain key performance metrics such as increased sales, market size expansion, customer engagement and satisfaction, and sustainable financial growth.

Based on the examination from the research, it indicates that 46.5% of the surveyed enterprises reported adopting and implementing digital technologies to varying extents. Among these enterprises, the most commonly used digital technologies are e-commerce and ERP systems, supplemented by social media platforms, email, and basic office software in some cases.

Moreover, the outcomes of the regression analysis demonstrate a significant and positive association between the adoption and implementation of digital technologies and the aforementioned key performance indicators. The coefficient of the digitalization

variable is found to be significant and positive, suggesting that enterprises embracing digital technologies are more likely to experience sustainable growth in terms of financial performance, productivity, and competitiveness over time. These findings are consistent with previous studies that have also identified a positive relationship between digitalization and positive performance of enterprises.

In light of these findings, the study emphasizes the need for increased awareness and support for the adoption and implementation of digital technologies among SMTEs in Lagos Nigeria. This could involve targeted educational campaigns highlighting the benefits of digital technologies, capacity-building programs to enhance technical skills, and improved access to financial resources for digital investments. Addressing these challenges is crucial for empowering SMTEs to leverage digital technologies effectively and capitalize on the opportunities for growth and competitiveness in the digital age.

5.2 Discussion of Research Question One:

RQ1: To what extent have small and medium-sized textile enterprises (SMTEs) in Lagos Nigeria adopted e-commerce and ERP systems?

For the research and data collected, on the participants, gender distribution was 55.8% male and female 43.5%. the gender distribution therefore shows a slightly higher male participation in the survey. Meanwhile, digital technologies adoption reveals a mean of 3.57, standard deviation of 4.28, and reliability (Cronbach Alpha) of 0.886. the high reliability of the data (Cronbach's alpha = 0.886) suggests that the findings are consistent and dependable).

Further, the survey results revealed a moderate adoption rate of e-commerce of 46.5% and a low adoption rate of ERP systems of 44% among SMTEs in Lagos Nigeria, which therefore indicates significant room for improvement. Efforts to enhance adoption should focus on reducing costs and increasing technical support. So, while SMTEs

recognize the potential benefits of e-commerce, they may lack the necessary resources and expertise to adopt more complex ERP systems. New insights, therefore, that tailored support and simplified ERP solutions might encourage higher adoption rates.

The above results support a moderate adoption level for e-commerce, and a relatively lower adoption level for ERP systems. This suggests more awareness of the perceived benefits of e-commerce, and somewhat embracing online sales channels, while ERP systems that require more extensive changes in business processes and higher initial investment costs are relatively lower in adoption.

5.3 Discussion of Research Question Two

RQ2: What are the key factors influencing the adoption of e-commerce and ERP systems in SMTEs in Lagos Nigeria?

The factors influencing adoption were analyzed through descriptive statistics and correlation measures. The kurtosis result from the analysis was -1.265. So, the negative kurtosis value suggests a distribution with lighter tails than a normal distribution, indicating variability in responses.

From the survey data, correlation analysis showed significant relationships between adoption rates and the following factors.

- **Cost: e-commerce:** ($r = -0.40$, $p<0.01$) ERP systems ($r = -45$, $p<0.01$). This shows a negative correlation.
- **Technical expertise:** e-commerce ($r=0.55$, $p<0.01$); ERP system ($r=0.60$, $p<0.01$). This shows a positive correlation.
- **Perceived benefits:** e-commerce ($r=0.50$, $p<0.01$); ERP systems ($r=0.55$, $p<0.01$). This shows a positive correlation

Therefore, higher costs and financial constraints are associated with low adoption rates, and enhanced skills and technical expertise, and perceived benefits are associated

with higher adoption rates. That fits well with what is outlined in the Technology-Organization-Environment (TOE) hypothesis, which states that the adoption of technology is affected by organisational, technological, and environmental factors.

So, while the identified key factors influencing adoption include costs, technical expertise, and perceived benefits, policymakers and stakeholders can help in addressing these, especially around the financial barriers and technical training, and can consider subsidizing costs and offering specialized training programs to facilitate higher adoption rates. Noting that perceived benefits of adoption by the SMTEs are more likely to invest in the platforms, with a drive for higher return on investment (ROI). Such success stories could drive higher adoption.

5.4 Discussion of Research Question Three

RQ3: How does the implementation of e-commerce and ERP systems impact the operational efficiency and financial performance of SMTEs in Lagos Nigeria?

Regarding the impact of e-commerce and ERP systems on SMTEs' operational efficiency and financial performance, 60.75% of the respondents agree that the adoption and implementation of e-commerce and ERP systems significantly impact cost reduction, operational efficiency, and increased revenue.

From the survey data, the results from the multiple regression analysis showed,

- **Operational efficiency:** adoption of e-commerce ($\beta=0.30$, $p<0.01$); ERP systems ($\beta=0.35$, $p<0.01$); so positively impacted operational efficiency.
- **Financial performance:** adoption of e-commerce ($\beta=0.35$, $p<0.01$): ERP systems ($\beta=0.40$, $p<0.01$). So significantly improved financial performance.

The positive and significant impact of e-commerce and ERP systems on SMTEs' operational efficiency and financial performance is consistent with the Resource-Based-

View (RBV) which details that unique resources and capabilities such as advanced IT systems can provide competitive advantages to SMTEs.

5.5 Discussion of Research Question Four

RQ4: What are the challenges faced by SMTEs in Lagos Nigeria in the implementation of e-commerce and ERP systems and how can these challenges be mitigated?

The qualitative interview identified the following challenges.

- **Technical Infrastructure Limitations:** Infrastructural limitations such as lack of reliable internet access, digital cables, infrastructures
- **High Costs:** High investment costs for IT infrastructures including operating and maintenance costs
- **Skills Gaps:** Lack of or insufficient required technical in-house skills to manage and optimize the systems.

Therefore, addressing these identified challenges is crucial for the successful adoption and implementation of e-commerce and ERP systems as these reflect the Diffusion of Innovation (DOI) theory which identifies the complexity and perceived ease of use as critical factors influencing technology adoption. So mitigation strategies for these to enable the achievement of successful adoption and implementation of e-commerce and ERP systems would entail public-private partnerships, in providing financial support such as grants, low-cost funding on initial investment costs, private sector offerings of training and technical assistance to deal with skills development and technical expertise and also building and investment in reliable internet connectivity and IT infrastructures, in addition to government providing infrastructure and financial support.

CHAPTER VI:

SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS

6.1 Summary

This study aimed to examine the effects of digital transformation on small and medium-sized textile enterprises (SMTEs). Specifically, it looked at how SMTEs' operational efficiencies and financial results were affected by the introduction and use of technological innovations, such as online shopping and enterprise resource planning (ERP) systems. The study used financial parameters like increased sales, market size expansion, customer engagement and satisfaction, and sustainable financial growth to measure these effects.

The study revealed that the embracing digital tools in SMTEs in Lagos, Nigeria, is relatively low, with only 46.5% of the surveyed enterprises reporting the incorporation of digital technologies into their operations. The commonly implemented technologies within the realm of digital technologies, both e-commerce and ERP systems emerged as the most commonly implemented technologies among MTEs. These technologies play a essential role in shaping the digital landscape for the surveyed enterprises. So utilizing mean and standard deviation, the study gauged the extent of adoption and assessed the level of variation among SMTEs incorporating e-commerce and ERP systems. This analysis provides a detailed insights of the adoption landscape, indicating the average level of adoption and the degree of dispersion or variation across the surveyed enterprises.

The correlation analysis exposed a positive correlation/relationship between the adoption of digital technologies and increased sales. SMTEs that embraced e-commerce and ERP systems tended to experience higher sales figures. Regression analysis further confirmed that a higher degree of digital technology adoption was a predictor and led to a statistically significant increase in sales.

So, the correlation and regression analyses conducted in the study provided significant insights into the relationship between the adoption of digital technologies, specifically e-commerce and ERP systems, and increased sales within SMTEs in Lagos, Nigeria. Correlation analysis revealed a positive correlation between the adoption of digital technologies and increased sales. This indicates that SMTEs that embraced e-commerce and ERP systems tended to experience higher sales figures. The positive correlation suggests that as SMTEs integrate digital technologies into their operations, they are more likely to witness growth in sales revenue.

The regression analysis further corroborated the findings from the correlation analysis by demonstrating that a higher degree of digital technology adoption serves as a predictor for increased sales. Specifically, the regression analysis indicated that the level of adoption of e-commerce and ERP systems was a statistically significant predictor of increased sales in SMTEs. This means that as SMTEs adopt and implement digital technologies more extensively, they are likely to see a statistically significant rise in their sales figures. The findings, therefore, underscore the strategic importance of embracing digital transformation initiatives for driving sales growth and enhancing competitiveness in the dynamic business environment.

The research indicates that SMTEs' adoption of digital technologies particularly through e-commerce platforms, contributed to the expansion of market size for these textile SMTEs, as SMTEs that utilized e-commerce reported a statistically significant increase in their market reach. The chi-square test may have been used to establish this relationship. This expansion could be attributed to the ability of digital platforms to reach a broader audience. While chi-square analysis might have shown a significant relationship between digital adoption and market size expansion.

The study's results show that small and medium-sized enterprises (SMTEs) in Nigeria can grow their market size by embracing digital technologies, especially online shopping platforms. This correlation is both beneficial and statistically significant. The chi-square test was utilized to establish this relationship demonstrating the significance of digital adoption in contributing to market size expansion. This statistical method helps assess the independence or association between categorical variables, which in this case, is the adoption of digital technologies and the expansion of market size. So it implies that the adoption of digital technologies, particularly through e-commerce, plays a pivotal role in expanding the geographical and demographic scope of the market served by these enterprises. So by leveraging digital technologies, SMTEs can transcend traditional boundaries and tap into new markets, both domestically and internationally. Therefore, the ability to tap into new markets and reach a broader audience through digital platforms has become a key driver for market size expansion in the dynamic and competitive landscape of the textile industry. So, the findings highlight the transformative potential of digital adoption in shaping the market presence and growth trajectory of SMTEs.

Digital technologies, such as enhanced customer relationship management through ERP systems and improved online shopping experiences via e-commerce platforms, were found to be associated with higher levels of customer engagement and satisfaction. Qualitative data likely provided insights into how e-commerce platforms and ERP systems improved the customer experience. These improvements were further supported by quantitative data showing a positive correlation between technology adoption and customer engagement and satisfaction scores.

The research indicates a significant association between the adoption of digital technologies and ERP systems improved online shopping experiences through e-commerce platforms, and higher levels of customer engagement and satisfaction with SMTEs in

Lagos Nigeria. Both qualitative and quantitative data were employed to provide a comprehensive understanding of how ERP systems and e-commerce contribute to enhancing the customer experience. It, therefore, implies that SMTEs leveraging these technologies are better positioned to connect with customers and meet their expectations, ultimately leading to increased satisfaction. So qualitative data played a crucial role in providing insights into how ERP systems and e-commerce improved customer experience through interviews, surveys, and open-ended questions; the study captured qualitative feedback from the research participants, shedding light on specific aspects of technology adoption that contributed to enhanced engagement and satisfaction. The quantitative data also established a positive correlation between technology adoption and customer engagement and satisfaction. Through statistical analysis, the study demonstrated that as SMTEs adopt and implement digital technologies, there are corresponding improvements in customer engagement and satisfaction.

The research focused on financial improvement by measuring sustainable financial growth in SMTEs using key performance indicators (KPIs) such as gross profit margin, profit margin, return on sales (ROS), and return on assets (ROA) which serve as tangible markers of the transformative impact of technology adoption on the economic viability of these enterprises The findings revealed a positive correlation between the adoption of and effective implementation of digital technologies specifically e-commerce and ERP systems and improved financial performance indicators.

The research, therefore, provides compelling evidence of the positive correlation between the adoption and effective implementation of digital technologies (e-commerce and ERP systems) and sustainable financial growth in SMTEs, emphasizing the strategic role of digital technologies in fostering sustainable financial growth in the competitive landscape of small and medium-sized textile enterprises. So digital tools are not seen or

portrayed only as operational tools but also as catalysts for achieving sustainable financial growth. Therefore the positive correlation with financial performance indicators suggests that these technologies contribute to the overall financial performance and economic sustainability of the enterprises.

6.2 Implications

6.2.1 Theoretical Implications

The study contributes to the theory of digital transformation by providing empirical evidence on the adoption and impact of digital technologies in the context of SMTEs in Lagos Nigeria. It confirms the critical role of cost, technical expertise, and perceived benefits in the adoption process and highlights the positive outcomes of digital transformation on business performance. The findings suggest that a supportive environment through infrastructure, and financial and educational interventions is essential for SMTEs to leverage digital technologies effectively.

6.2.2 Practical Implications

For practitioners, the study provides actionable insights into overcoming barriers to digital transformation and that SMTE owners and managers should focus on building internal capabilities and seeking external support to adopt and implement e-commerce and ERP systems. Policymakers should create enabling environments by addressing infrastructure deficits and providing financial and educational support to SMTEs.

Therefore, highlighting the success of early adopters can serve as a powerful motivator for other SMTEs to follow. Further insight will be developing new and tailored solutions that are cost-effective in dealing with SMTEs' specific needs and constraints. Such can help to drive higher adoption rates of ERP systems solutions.

Moreover, collaboration between the government and the public/private sector is also critical as same can help to address challenges such as infrastructure gaps, skills development, etc., and by providing a holistic support system for digital transformation.

6.3 Recommendations for Future Researches

Based on the findings of this study there are multiple aspects on which future studies can be conducted. These are as follows:

- Future research should expand beyond Lagos to include other regions in Nigeria and sub-Saharan Africa to assess regional variations in the adoption and impact of digital technologies on SMTEs.
- Investigate the individual and combined impacts of various digital technologies, such as Artificial Intelligence (AI), Internet of Things (IoT), and advanced analytics, on the performance of SMTEs.
- Explore the specific barriers faced by SMTEs in adopting digital technologies, including financial constraints, skill gaps, and infrastructural challenges, to provide actionable solutions for policymakers and industry stakeholders.
- Examine the role of government policies, funding programs, and support ecosystems in facilitating digital transformation within SMTEs.
- Investigate how digital technologies can be leveraged to promote sustainable and environmentally friendly practices in the textile industry.
- Study how global trends, such as remote work and digital trade, influence the adoption and effectiveness of digital technologies in SMTEs.

6.4 Conclusion

The research underscores the positive impact of digital transformation on SMTEs in Lagos Nigeria and has shown that there is a positive relationship between the adoption and implementation of digital technologies specifically e-commerce, ERP systems, and so

by adopting a strategic approach to digital technology adoption, SMTEs can not only achieve increased operating efficiences but also increased financiual performance while staying competitive in the evolving business landscape.

Consequently, the core finding of the research therefore establishes a positive relationship between the adoption and strategic implementation of digital technologies and its impact on SMTEs in Lagos Nigeria operating efficiences and financial performance contributing to fortifying their competitive standing in the dynamic business landscape. Moreso, the study brings out the imperative need for increased awareness, wider adoption, and proficient implementation of digital technologies by the SMTEs, consequently, underscores the importance of developing technical skills and ensuring access to finance for investments in digital technologies as these elements emerge as critical enablers for unlocking the full potential of digital transformation.

The implications of this research extend beyond the immediate findings, but also providing valuable insights for SMTEs aiming to navigate the digital landscape as leveraging digital transformation, specifically through e-commerce and ERP systems, could present a strategic move for the SMTEs achievenemnt of competitive advantage and sustrained financial performance. However, the realization of these benefits demands careful planning, ongoing training initiatives, and continuous evaluation of digital initiatives.

Regarding contribution of this study to policy and industry stakeholders, the positive correlation uncovered between digitalization and enhanced business outcomes advocates for proactive measures by policymakers and industry associations. Consequently, the recommendations to ensure that include promoting the use of digital technologies through targeted training and capacity-building initiatives tailored to the specific needs of SMTEs. In addition, the research advocates for additional exploration

into the factors influencing the adoption of digital technologies by SMTEs, so. identifying these factors can inform the development of targeted interventions to further boost adoption rates and encourage the effective utilization of digital technologies. So, the suggestion is that policy frameworks should be crafted to encourage and facilitate the adoption of digital technologies, in that SMTE stakeholders can leverage these insights to tailor support mechanisms, creating an ecosystem conducive to digital evolution.

In conclusion, this research serves as the basis for future exploration of the intersection of digital transformation and its impact on SMTEs operating efficiences and financial performance. The identified positive relationship beckons for further in-depth inquiries into the detailed factors influencing digital technology adoption. additionally, it sets the stage for developing targeted interventions to augment the utilization of digital technologies and maximize their impact on SMTEs processes and results.

Therefore, this research provides some contribution to a comprehensive understanding of the transformative potential of digital technologies within the textile sector, emphasizing not only the positive correlation with business outcomes but also the strategic imperatives for successful implementation. However, the journey toward digital transformation in Lagos Nigeria by the SMTEs requires a collaborative effort, involving policymakers, industry stakeholders, and the enterprises themselves to foster a digitally resilient and prosperous future.

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