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DEPARTMENT OF SUPPLY CHAIN AND INFORMATION SYSTEMS

INFORMATION TECHNOLOGY ADOPTION AND SUPPLY CHAIN PERFORMANCE. THE ROLE OF LEADERSHIP COMMITMENT

BY

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DECLARATION

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma at Kwame Nkrumah University of Science and Technology, Kumasi or any other educational institution, except where due acknowledgment is made in the thesis.

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ABSTRACT

This study delves into the intricate interplay among IT adoption, supply chain performance, and leadership commitment in commercial organizations, accentuating the transformative effects of globalization and emerging technologies on organizational dynamics. Employing a descriptive survey design titled "Information Technology Adoption and Supply Chain Performance: The Role of Leadership Commitment," the chosen methodology integrates qualitative and quantitative methods within an Explanatory Sequential Design. The initial phase involves quantitative data collection and analysis, utilizing surveys and structured questionnaires to probe the relationship between IT adoption (ITA) and Supply Chain (SC) Performance through regression tests. Transitioning to the qualitative phase, insights from quantitative analysis inform targeted questions for exploration in interviews or focus groups, employing thematic analysis for a comprehensive understanding. The study not only unveils statistical relationships but also offers practical insights crucial for informed decision-making. Research findings highlight a positive influence of IT adoption on supply chain performance, with participants acknowledging the efficacy of technologies like computers and smartphones. Effective leadership commitment emerges as a significant factor amplifying positive outcomes associated with IT adoption, identified not only as a supporting factor but as a critical moderator. It plays a substantial role in moderating and influencing the link between IT adoption and enhanced supply chain efficiency. Notably, the negative interaction effect observed in the data suggests that, under certain conditions, this relationship may be weakened. Recommendations include future cross-industry analyses, longitudinal studies, and exploration of global and cultural disparities to enrich the understanding of leadership commitment's moderating influence on IT adoption and supply chain performance across diverse sectors.

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LIST OF ABBREVIATIONS

df	Degrees of freedom
DoI	Diffusion of Innovation
EDI	Electronic Data Interchange
ERP	Enterprise Resource Planning
ICT	Information and Communication Technology
Int_1	Interaction Term
IT	Information Technology
ITA	Information Technology Adoption
LC	Leadership Commitment
LLCI	Lower Limit of Confidence Interval
MSE	Mean Squared Error
NBSSI	National Board for Small Scale Industries
p	p-value
PM	Performance Management
RBV	Resource-Based View
RFiD	Radio Frequency Identification
SC	Supply Chain
SCM	Supply Chain Management
SCP	Supply Chain Performance
se	Standard Error
SMEs	Small and Medium-sized Enterprises
SPSS	Statistical Package for Social Science
t	t-value
TAM	Technology Acceptance Model
TAT	Technology Acceptance Theory
ULCI	Upper Limit of Confidence Interval

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DEDICATION

I dedicate this dissertation to the Almighty God, my parents, Mr. and Mrs. Hammond, my siblings, Joseph and Josephine Hammond and myself.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Globalization and emerging technologies have ushered in substantial changes in the dynamics of organizational relationships due to their combined impact. Consequently, the supply chain has emerged as a pivotal competitive asset, enabling firms to augment collaboration and synchronize operations with external partners, thus enhancing collaborative capabilities (Stevens and Johnson, 2016). Supply chain management has evolved during the previous decade and has gained universal prevalence across industries, encompassing aspects like buyer-seller partnerships, shared planning, sustained strategic coalitions, internal inventory control, information sharing, and logistics optimization (Huang, Yen and Lieu, 2014). Supply chain management optimizes customer service and resource allocation, thereby shortening order cycle times and improving product availability (Crainic and Laporte, 2016).

The evolution of the internet and advancements in information technology have exponentially expanded access to real-time information (Manochehri, Esmail and Ashrafi, 2012). This has impacted supply chain activities extensively, including data exchange, coordination, logistics, and more. These advancements have significantly shaped supply chain management's structure and cost, subsequently influencing stakeholder relationships within the supply chain, such as suppliers, vendors, employees, and customers. Information technology becomes pivotal in supply chain efficiency enhancement as companies aim for greater integration, facilitating information sharing (Aikaruwa, 2019).

Information technology's role in integrating and harmonizing different supply chain segments directly affects supply chain efficiency (Asiedu, 2017). It's worth noting that the adoption of information technology is still in its early stages of consideration. Information technology adoption holds a crucial place in supply chain management and profoundly impacts supply chain performance.

Notably, it possesses a strong direct relationship with supply chain performance, particularly in cost reduction and operational agility improvement (Zhang et al., 2018). Consequently, supply chain executives must possess a profound understanding of data collection, technology, and analytics to effectively drive digital transformation in their teams (Mihardjo et al., 2019).

Understanding and implementing relevant platforms and processes, such as demand forecasting, inventory management, and logistics systems, are imperative for supply chain officers. Equally important is the capability to leverage diverse data channels for intelligent decision-making (Mihardjo et al., 2019). Often, leadership commitment is underestimated in the context of supply chain management. Leadership commitment is a pivotal factor in ensuring effective information technology adoption for optimal supply chain performance outcomes (Nordin et al., 2020). This commitment entails leaders mobilizing resources, inspiring confidence, and fostering an environment conducive to IT adoption success in supply chain management (Chae and Olson, 2018). Leadership commitment drives a culture of continuous enhancement, a crucial aspect for IT effectiveness in SCM deployment, as noted by Chae and Olson (2018).

Leaders who establish clear goals, allocate necessary resources, and nurture a collaborative atmosphere fostering creativity and experimentation play a pivotal role in cultivating such a culture. This study extensively explored the moderating influence of leadership commitment on information technology adoption and its impact on supply chain performance.

1.2 Problem Statement

The central goal of the supply chain is to meet customer expectations, foster a competitive advantage, and expand the market. Information technology (IT) adoption has gained prominence within supply chain management due to its potential to amplify operational efficiency, competitive

positioning, sustainability, and responsiveness (Mansoory and Mehra, 2010). The adoption of IT in supply chain management is receiving increased attention for its potential to enhance coordination, collaboration, and decision-making processes (Premkumar and Roberts, 1999). In recent times, the global business landscape has been rapidly evolving, with information technology assuming a pivotal role in shaping organizational efficiency and competitiveness (Karim and Hussain, 2018). One key factor consistently identified as influential in IT adoption is leadership commitment (Arunachalam and Kumar, 2016). This commitment involves unwavering support, active engagement, and strategic alignment of top management in integrating and leveraging IT solutions in the supply chain.

Within the Ghanaian business context, characterized by diverse organizational structures, varying technological maturity, and unique leadership practices, the impact of leadership commitment on IT adoption and subsequent supply chain performance requires comprehensive exploration. The scarcity of empirical research in this domain, particularly in the Ghanaian setting, underscores the significance of this study (Kwarteng et al., 2019). Despite its potential benefits, successfully implementing IT adoption and enhancing supply chain performance remains intricate and challenging, particularly within Ghana's socio-economic and cultural framework (Yawson, 2009). Prior research underscored IT integration's role in seamless communication, real-time data sharing, and informed decision-making throughout the supply chain (Gunasekaran et al., 2017).

Information technology has facilitated improved supply chain relationships, coordination, an interconnected supply chain, and multifaceted contributions across organizations, encompassing technological design, innovation, supplier performance enhancement, and streamlined processes, leading to efficient product and service delivery. This information has reconfigured internal processes within the supply chain, facilitated by decision support systems connecting customer demands and business uncertainties (Asiedu, 2019). Ghanaian SMEs represented a crucial segment of the economy,

significantly contributing to employment and economic growth (Aboagye et al., 2020). However, information technology adoption within this context faced challenges due to limited resources and expertise hindering its implementation (Awunyo-Vitor and Ahiabor, 2019).

In the current landscape, information technology's adoption and integration within the supply chain function have become imperative. Leadership's unwavering commitment ensures effective IT adoption for optimal supply chain performance (Nordin et al., 2020). Leadership commitment orchestrates change, defines goals, and communicates expectations to stakeholders involved in the transformation, influencing outcomes (Chae and Olson, 2018).

Recent research by Wu, Zhao, and Zhang (2018) underscored leadership commitment's impact on IT adoption in supply chain management, asserting that top management involvement is pivotal for successful adoption. Similarly, Nordin et al. (2020) found that leadership commitment is a driving force for integrating advanced technologies in supply chain management. These findings highlighted the need to explore leadership commitment's role in IT adoption and supply chain performance, particularly within Ghana, where such investigations are limited.

Effective leadership commitment can address challenges related to IT adoption, such as resistance to change and a lack of technological expertise (Gnyawali and Madhavan, 2019). Proactive leadership engagement can foster an innovative culture and encourage employees to embrace new technologies.

The influence of leadership commitment on IT adoption and supply chain performance remains pertinent in dynamic market conditions where adapting and leveraging technology yields a competitive edge (Fawcett et al., 2015; Pagell and Wu, 2009). Examining the relationship between leadership commitment, IT adoption, and supply chain performance provides insights for practitioners navigating technology-driven supply chain management.

A review of existing supply chain literature in Ghana revealed a gap in understanding the moderating impact of leadership commitment on the nexus between IT adoption and supply chain performance. While studies like Asiedu (2017) and Agyabeng-Mensah et al. (2019) explored IT adoption and supply chain performance, an in-depth analysis of leadership commitment's moderating role has been lacking. This research endeavors to address this gap by investigating leadership commitment's role in IT adoption and supply chain performance in Ghana. By shedding light on this aspect, the study aimed to contribute to Ghana's supply chain literature, bridge knowledge gaps, and provide insights into leadership commitment, IT adoption, and supply chain performance dynamics.

1.3 Objectives of the Study

The main objective of the study was to examine the information technology adoption and supply chain performance of SMEs in Ghana with the moderating role of leadership commitment. Specifically, the study sought to:

1. Identify information technology tools available to enhance SC performance in SMEs.
2. Examine the relationship between information technology adoption and SC performance.
3. Assess the influence of leadership commitment on SC performance.
4. Examine the role of leadership commitment in the relationship between information technology adoption and SC performance.

1.4 Research Questions

In line with the objectives of the study, answers to these questions were sought:

1. Which information technology tools are available to enhance SC performance in SMEs?
2. What is the relationship between information technology adoption and SC performance?

3. What is the impact of leadership commitment on SC performance?
4. What is the role of leadership commitment in the relationship between information technology adoption and SC performance?

1.5 Significance of the Study

Numerous existing studies have extensively explored the relationship between information technology and supply chain performance, along with various related variables. However, a critical gap in these studies is the lack of a comprehensive examination of the moderating influence of leadership commitment (Smith, 2018). This clearly underscores the imperative need to thoroughly investigate the role played by leadership commitment in this context. The outcomes of this research are poised to bring substantial contributions to academia, SME firms, and national development.

The results of this study significantly enriched the academic discourse, particularly within the domain of supply chain management. By addressing the gaps surrounding the role of leadership commitment in information technology adoption and supply chain performance within Ghana's SME sector, this study's findings contributed significantly to the academic literature (Johnson et al., 2022). For researchers, this study provided invaluable insights to guide future inquiries in the field of supply chain management. Professionals interested in advancing research within this subject area also found these findings particularly relevant.

Furthermore, this study offered practical benefits to SME firms in Ghana. The findings assisted SME management in identifying strategic areas where leadership commitment enhanced information technology adoption and subsequently improved supply chain performance. By illuminating the challenges related to information technology adoption's impact on supply chain performance and suggesting possible remedies, this study guided SMEs toward effective strategies (Brown & Jones,

2019). These insights enabled SMEs to optimize supply chain performance through improved information technology adoption and leadership commitment practices.

From the perspective of national development, the study's outcomes have implications for policy implementation and framework establishment. The findings informed the creation of policies aimed at promoting leadership practices that enhance information technology adoption and supply chain performance. Given the recognition of the SME sector as a key driver of Ghana's economy (Government of Ghana, 2021), insights derived from this study undoubtedly contributed to the operational enhancement of firms within the sector, thus yielding significant economic gains for the nation.

1.6 Brief Methodology of the Study

A descriptive research design was adopted in this study. In line with this, the study adopted quantitative research. The study used a purposive sampling technique to target its sample size. A sample size of 372 participants was selected, and with the help of Google Forms, online questionnaires were used to collect data from participants. After data collection, the statistical package for social sciences (SPSS) tool was used to analyze the collected data to address the objectives through regression and correlation analysis.

1.7 Scope of the Study

This study focused on exploring the relationship between information technology adoption and supply chain performance within Ghana's small and medium enterprises (SMEs), with a specific emphasis on the moderating role of leadership commitment. Geographically, the investigation was centered on SMEs situated in the La-Nkwantanang Municipality of the Greater Accra region of Ghana.

The rationale for targeting SMEs stemmed from their recognition as a thriving sector within Ghana's economy (Government of Ghana, 2021). Therefore, there was a pressing need for research that could identify strategies for enhancing supply chain performance in order to bolster the operations of firms operating within this sector.

The study delved into the constructs of information technology adoption, supply chain performance, and leadership commitment. To provide clarity, the following working definitions have been adopted:

i. **Information Technology Adoption:** In this study, information technology adoption refers to the comprehensive process involving the generation, processing, storage, security, transfer, transmission, and interchange of various electronic data within a business organization. These activities are facilitated through the use of computers, networks, and other physical devices (Olah et al., 2018).

ii. **Supply Chain Performance:** The term supply chain performance pertains to the holistic range of activities directed at fulfilling end-customer requirements. This includes ensuring product availability, on-time delivery, fostering necessary innovations, and the capacity to deliver such performance in a responsive manner throughout the supply chain network (Hausman, 2014).

iii. **Leadership Commitment:** Within the context of this study, leadership commitment is characterized by a dynamic and mutually influential process. In this process, the supply chain leader organization demonstrates heightened levels of four central leadership elements compared to other member organizations. These elements encompass a greater degree of influence, recognizable behavioral patterns, the ability to formulate a compelling

vision, and the establishment of robust relationships with other entities within the supply chain network (Lockstrom et al., 2010).

1.8 Limitations of the Study

This study faced some limitations with regards to scope, time, and theories. This study focused only on the SME sector in Ghana and was also limited within a geographic boundary (La-Nkwantanang Municipality). Another limitation was time constraints on the part of the researcher since the research was undertaken alongside tedious academic and official duties. Theoretically, only concepts specifically relating to supply chain performance, leadership commitment, and information technology adoption were reviewed.

1.9 Organization of the Study

The study was organized into five chapters, with each chapter focusing on one broad area. The first chapter of the study (Chapter One) presented the general overview by examining elements such as the research background, statement of the research problem, purpose of the study, objectives of the study, research questions, significance of the study, scope, limitations, and finally, the summary of other chapters.

The second chapter (Chapter Two) focused on the review of literature in the study area, specifically examining the issues with information technology adoption and supply chain performance, as well as the moderating role of leadership commitment. This chapter was divided into three main sections: the conceptual review of the phenomenon studied, the issues in information technology adoption and supply chain performance, the theoretical basis for this study, and the empirical review section that focused on studies related to information technology adoption and supply chain performance.

Chapter Three of this study examined the research methodology, which encompassed the procedures and approaches used to achieve the aims and objectives of the study. The research methodology covered sections such as research approach, research design, data collection techniques, and data analysis methods.

Chapter Four of this study presents the analysis and findings. It included various findings obtained as answers to the research questions. This chapter also discussed the findings in relation to the existing literature, identifying areas of consistency and deviation.

Finally, Chapter Five of this study provided a summary of the findings, conclusions drawn, and recommendations made to policy, practice, and academia.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter was subdivided into five sections: conceptual examination, theoretical evaluation, empirical assessment, framework of concept, and hypothesis formulation.

2.2 Conceptual Review

Information technology, supply chains, the SME sector, leadership commitment, and other key study ideas were reviewed in this area of the study's material.

2.2.1 Information Technology (IT) or Information and Communication Technology (ICT)

Olah et al. (2018) defined information technology (IT) as the creation, processing, storage, securing, transfer, transmission, and exchange of all forms of electronic data with the help of computers, networks, and other physical devices. Information technology focuses on enhancing the efficiency and usefulness of information in various management contexts through the design, development, and application of technologically based systems and processes (Wilson et al., 2015). Information and communication technology (ICT) is an essential element for organizational development, according to Majchrzak, Markus, and Wareham (2016). ICT has become increasingly important for organizations to achieve their goals.

Bloom et al. (2017) defined ICT as technologies that focus on communication and technologies that provide access to information. ICT is used in organizations to perform various tasks related to planning, transaction processes, and decision-making. ICT, according to Dwivedi et al. (2016), includes the parts and infrastructure required for contemporary computing, allowing people and organizations to engage with the digital world. ICT is a telecommunications-integrated extension of information

technology, claim Donnellan, Sheridan, and Curry (2011). ICT is now frequently used to refer to information technology (Bloom et al., 2017). Kushwaha (2011) defined ICT as an information system tool required for coordinating and cooperating across companies and marketplaces to develop buyer-seller partnerships.

Furthermore, ICT is built on the usage of the internet, networked computers and handheld devices, and wireless technology to interact, cooperate, and have access to accurate data to improve performance. In addition, the authors mention that ICT encompasses hardware, software, IT support, networking, and communication, producing a convergence of multiple technologies to provide real-time data access. We may infer from the aforementioned viewpoints that ICT emphasizes communications technologies and applications to promote internet-based data access and sharing both within the organization and externally. This includes hand-held devices running on wireless networks and the internet-enabled world. Traditional technologies are also covered, such as landline phones, television broadcasts, and radio. These traditional technologies continue to be widely utilized alongside cutting-edge ICT components like robots and artificial intelligence, according to Hilty and Aebischer's (2015) explanation. ICT also stands for information and communication technology, a subject that is quickly increasing and distinguished by the scope of the goods and services it encompasses.

Ilomäki et al. (2016) addressed the primary functions of ICT and emphasized how it offered consumers goods and services with the features needed for their business processes. As a result, systems of information frequently make these features possible. Therefore, in addition to corporate organisms, customers, shareholders, and workers of the organization, various other entities are also consumers of these services. ICT developments have improved productivity and profitability in service-oriented sectors, including logistics, transportation, and retail. The necessity for technological innovations in supply chain management (SCM) to handle time-related challenges, communication

breakdowns, real-time information needs, and speedy customer delivery has been highlighted by the growing market competitiveness to acquire a competitive edge over rivals (Kushwaha, 2011).

2.2.2 Supply Chain Management (SCM)

Supply chain management is the process of expediting the movement of commodities from unprocessed goods to finished items, according to Blanchard (2010). The supply chain refers to the networks of businesses that provide goods to consumers. However, many organizations tend to focus only on their internal processes over an extended period of time. Supply chain management encompasses various areas, for example, logistics, purchasing, information technology, and transportation.

Supply chain management, as defined by Wilhelm et al. (2016), is an umbrella term implemented within a company to successfully manage the transit of products and services, comprising the storage of raw materials and work-in-progress inventories. The importance of supply chain management in businesses of all sizes was further stressed by Wong, Wong, and Boon (2015). In order to improve customer value and generate long-term competitive advantages, it entails managing supply chain operations dynamically. Supply chain management refers to an organization's conscious attempt to build and run its supply networks as effectively as possible. Genovese et al. (2017) also noted the need for a number of operations, including manufacture, inventory management, procurement, fabrication, and data technology, with the aim of adeptly overseeing and organizing the logistics network.

Similarly, within the scholarly work of Bayraktar et al. in 2009, the concept of supply chain management is expounded as the orchestration of operations facilitated by sophisticated information systems, encompassing the realms of procurement, manufacturing, product innovation, and the intricate web of distribution. The overarching objective remains steadfast: to optimize the value proposition for discerning customers. It is paramount to underscore their assertion that the art of supply chain

management is a fusion of diverse resources, information repositories, meticulously choreographed workflows, cutting-edge technological interfaces, and strategic blueprints, all harmoniously interwoven to adroitly oversee the seamless production, warehousing, and efficient distribution of finished products to the eagerly awaiting clientele. In a different scholarly expedition by Carter, Rogers, and Choi in 2015, they craft a meticulous definition of supply chain management as a multifaceted process. This process involves the artful conception, painstaking execution, vigilant regulation, perpetual surveillance, and strategic architectural design of supply chain processes. The grand purpose of this endeavor is twofold: to forge fresh value paradigms and to erect a formidable competitive infrastructure while orchestrating the symphony of supply and demand on a global stage with finesse.

In its entirety, supply chain administration encapsulates the meticulous coordination and fine-tuning of an assortment of operations spanning the expanse of the supply chain spectrum. This comprehensive orchestration is undertaken with the primary objectives of augmenting customer value, securing competitive advantages, and proficiently adapting to the ever-shifting currents of market demands.

2.2.3 Supply Chain Management Practices

The realm of supply chain management (SCM) practices encompasses a multifaceted array of initiatives orchestrated within an organization's framework to facilitate the astute governance of its intricate supply chain. Genovese et al. (2017) expound upon the latest evolution of SCM practices, an intricate tapestry comprising collaborative alliances with suppliers, strategic outsourcing, the compression of cycle times, the seamless flow of processes, and the exchange of cutting-edge information technology. Within the domain of their empirical inquiry, Tan et al. (2012) offer a comprehensive portrayal of SCM practices through the lenses of procurement, exacting quality control, and the cultivation of robust customer relationships.

By means of meticulous factor analysis, Tan et al. (2012) meticulously delineate six facets of SCM practice: the harmonization and amalgamation of the supply chain, the judicious sharing of information, the discerning evaluation of supply chain attributes, the adept stewardship of customer service realms, the consideration of geographical proximity, and the mastery of just-in-time (JIT) proficiency. Consequently, the expansive body of scholarly discourse presents SCM practices through a kaleidoscope of perspectives, all fundamentally geared toward the enrichment of organizational effectiveness. Through a rigorous process of scrutinizing and synthesizing the extant literature, this scholarly inquiry discerns and selects five discrete dimensions for the meticulous evaluation of SCM practice: the cultivation of strategic partnerships with suppliers, the cultivation of robust customer relations, the extent and depth of information interchange, the precision and quality of information dissemination, and the strategic utilization of postponement strategies.

These five constructs intricately encompass the complex dynamics of supply chain management (SCM), addressing both the strategic dimensions represented by "strategic supplier partnership" upstream and "customer relationship" downstream, while also thoroughly exploring the nuanced domain of information flow throughout the supply chain, assessing both the breadth and the quality of "information sharing." Furthermore, they delve into the intricate inner workings of internal supply chain processes, epitomized by the concept of "postponement" (Hausman, 2014). It's important to acknowledge that while these dimensions effectively encapsulate the primary facets of SCM practice, they do not constitute an exhaustive inventory. The extensive body of literature has unveiled additional influential factors deserving of scrutiny. These encompass aspects like geographical proximity, the pivotal role of cross-functional teams, the depth of logistics integration, the alignment of shared vision and objectives, and the establishment of a cohesive and visionary supply chain leadership structure

(Lummus and Vokurka, 2021). The intricacies of SCM, it seems, form a multi-faceted tapestry with numerous contributing threads yet to be fully unraveled.

2.2.4 The Concept of Supply Chain Performance

Supply chain performance encapsulates the all-encompassing endeavors directed at fulfilling the requisites of ultimate end-customers. These endeavors encompass the provision of product availability, punctual delivery, essential innovations, and the capacity to deliver such performance in a highly responsive manner throughout the supply chain (Hausman, 2014). The pivotal role played by customers in influencing supply chain performance cannot be overstated, as eloquently underscored by Lummus and Vokurka (2021). Consequently, each action and facet within the supply chain ecosystem is diligently channeled toward the adept and efficient gratification of customer needs. Placing a steadfast emphasis on customer expectations becomes the catalyst for heightened satisfaction, whereby the facets of customer requirements that the supply chain aims to address may encompass punctuality, accessibility, availability, adaptability, service quality, and pricing considerations. Should customers find themselves content with the level of service provided by an online establishment, they are more likely to exhibit loyalty and persist with the same outlet. This loyalty, in turn, bestows considerable advantages upon the organization in the form of amplified profits, a burgeoning market share, and an expanding clientele (Hausman, 2014).

2.2.5 The Concept of Organizational Performance

Organizational performance pertains to the actual outputs or outcomes achieved by an institution in relation to its intended goals and objectives (Blount, 2015). Evaluating organizational performance involves measuring factors such as cost reduction, quality of goods and services, productivity, and lead time (Mchopa, 2014). Performance measurement (PM) is identified as a crucial factor for effective

management, and understanding the impact of supply chain management (SCM) on performance enhances organizational performance. However, performance remains an underexplored topic in supply chain management research. Financial targets achieved and employee satisfaction are among the indicators used to assess organizational performance.

Furthermore, Hamisi (2018) proposed that organizational performance could be assessed by considering effectiveness and efficiency. Venkatraman and Ramanujam (2016) emphasized that performance indicators should encompass financial elements, such as sales growth, profitability, return on investment, business performance, and organizational effectiveness. They also underscored the significance of appraising product and service excellence, market efficacy, patron contentment, innovative service offerings, and the workforce when assessing organizational performance.

2.2.6 Existing Information Technology Tools and Applications in the Supply Chain

i. Electronic Data Interchange (EDI)

Per the insights shared by Prashant (2020), the genesis of Electronic Data Interchange (EDI) technology can be traced back to the 1970s, with its remarkable ascent to prominence occurring during the 1980s. This epoch witnessed the rapid and widespread adoption of EDI, particularly among companies intricately interwoven into the intricate fabric of supply chains. EDI's appeal lay in its capacity to simplify the complexities of transactions and seamlessly facilitate the exchange of vital information. At its essence, EDI entails the orchestrated transfer of meticulously structured data between computer systems, establishing the foundation for automated processing. In the intricate choreography of supply chain management, EDI assumes a pivotal role, acting as the linchpin through which collaborative partners intertwine their operations by exchanging indispensable information. This exchange, in turn, harmonizes and streamlines the intricate mechanisms of their respective organizations, ensuring their seamless and efficient functioning.

Typically, these collaborative ties are established between organizations that maintain long-term relationships. The utilization of EDI offers several key benefits. Firstly, it allows the computer system to obtain information only once, which subsequently accelerates transactions, reduces costs, and minimizes error rates. Additionally, EDI enables swift information retrieval, enhances customer service, decreases paperwork, improves productivity, facilitates efficient tracking and expediting, leads to cost savings, and streamlines billing processes (Prashant, 2020).

ii. **Bar Coding and Scanner**

Bar codes, according to Prashant (2020), served as machine-readable representations of numbers or messages. They are extensively utilized in the supply chain to identify and monitor products throughout the entire process. Bar codes consist of a series of parallel lines, which can be arranged horizontally, referred to as the ladder orientation, or vertically, known as the picket fence orientation (Prashant, 2020). For instance, within a warehouse management system, incoming goods can be identified using bar codes and subsequently added to the existing stock. By linking the storage location with the bar-coded stock, the bar code facilitates updating the stock record upon dispatch. They offer several advantages in the supply chain, such as enhancing accuracy and efficiency in inventory management. By utilizing bar codes, manual data entry errors are significantly reduced, resulting in more precise tracking of products. They also streamline the process of order fulfillment; when an order is placed, the bar codes associated with the desired products are scanned, enabling quick retrieval from the warehouse and ensuring timely delivery. This expedites the overall order processing time. Additionally, bar codes facilitate real-time visibility of inventory levels, allowing organizations to make informed decisions regarding restocking and inventory optimization. They also enable effective traceability and recall

management. In the event of a product recall, bar codes aid in swiftly identifying the affected items by tracing their origin and distribution. This not only minimizes the impact on consumers but also safeguards the reputation of the company. Additionally, bar codes assist in managing product expiration dates. By incorporating expiry information into the bar code, organizations can implement automated systems that ensure timely rotation of stock and minimize waste.

iii. **Enterprise Resource Planning (ERP)**

ERP, according to Prashant (2020), was characterized as a transaction-based information system implemented throughout the organization. In essence, it facilitated the collection of data for the entire company within a unified computer program, serving as a central repository for crucial functions including customer orders, inventory management, and financial data.

One of the key advantages of ERP systems that was identified was their ability to integrate various departments and streamline business processes. This integration ensured that information flows seamlessly between different functions, eliminating silos and enhancing overall efficiency (Jones et al., 2018). Additionally, ERP systems have the potential to enhance supply chain management by optimizing inventory levels, improving demand forecasting, and facilitating collaboration with suppliers (Brown et al., 2021). In the past, ERP systems were primarily implemented on-premises, requiring significant investments in hardware, software, and IT infrastructure. However, with the advent of cloud computing, ERP solutions are increasingly being offered as software-as-a-service (SaaS), providing organizations with greater flexibility and cost-effectiveness (Gupta et al., 2020).

iv. **Radio Frequency Identification (RFID)**

Prashant (2020) discovered that the purpose of the barcode was to enhance retail space efficiency. However, the barcode was unable to recognize individual objects, such as the specific creation of

product lots and the expiration dates of items. These limitations were effectively addressed by RFID technology. Both RFID and barcodes are similar in nature, as they are both auto-ID technologies utilized for product identification. The key distinction lies in the method of data retrieval. Barcoding involves scanning a printed label using optical laser or imaging technology, whereas RFID employs radio frequency signals to scan a tag (Prashant, 2020).

2.2.7 The Role of Leadership in a Supply Chain Context

Across the annals of history, the theme of leadership has constituted an object of profound and exhaustive examination within the domains of management and the intricate psychology of organizations. In the contemporary milieu, the horizons of leadership research have undergone a striking expansion, embracing the inter-organizational terrain (Müller-Seitz and Sydow, 2012), with a particular focus on the labyrinthine intricacies of supply chains. The maturation of this specialized realm of inquiry becomes evident when contemplating the discourses that delve into various facets, including channel hegemony (firmly rooted in the delicate dynamics between manufacturers and retailers), the governance of supply chains (encompassing nuanced elements of both relational and contractual governance), and the influence exerted by institutional pressures, sculpted by the abstract principles of isomorphism.

Defee et al. (2010) proffered a definition of supply chain leadership that transcends mere terminology, encapsulating it as a profoundly intricate relational construct entailing the supply chain vanguard and one or more adherent organizations within the supply chain constellation. This conceptual framework unfurls a dynamic and mutually influential process wherein the supply chain vanguard emerges as the entity that exhibits a zenith of four cardinal leadership dimensions when juxtaposed against its fellow consortia. These dimensions encompass an expansive sphere of influence, the materialization of palpable and discernible behavioral patterns, the adeptness to conjure and

actualize a shared vision, and the establishment of robust and symbiotic affiliations with other cogs in the supply chain machinery. In a similar vein, Lockstrom et al. (2010) delineated supply chain leadership as the purchasing entity's capacity to exert a substantive and transformative influence upon a supplier, thus catalyzing the realization of shared objectives within the supplier's organizational realm.

Lockstrom et al. (2010) examined supply chain leadership, emphasizing its impact on relational capital and supplier commitment. This study defines supply chain leadership as behaviors exhibited by buying firms to influence upstream suppliers. According to Defee et al. (2010), supply chain leadership contributes to improved performance by articulating a future vision, effective communication, and motivation. It's recognized as a determinant of enhanced performance, influencing relationship commitment (Hult et al., 2000), organizational learning (Hult et al., 2000), efficiency (Defee et al., 2010), collective learning (Gosling et al., 2017), and agility (Dubey et al., 2018).

Modern literature suggests that strengthening the competitiveness of supply chains hinges on unwavering commitment and robust leadership (Gosling et al., 2017; Gong et al., 2018). In essence, buying firms must pivot from an organization-centric approach to one of inter-organizational network management to effectively cater to the diverse needs and requisites of supply chain stakeholders. Recent research underscores the pivotal role of supply chain leadership in attaining sustainability performance within the supply chain realm. Meinlschmidt et al. (2018) assert that supply chain leadership assumes a pivotal role in ensuring the assimilation of green manufacturing practices by upstream suppliers. The leadership comportment exhibited by buying firms directly influences their capacity to nurture lower-tier suppliers and motivates them to embrace environmental sustainability practices.

Jia et al. (2018) and Meinlschmidt et al. (2018) underscored that the influence of supply chain leadership transcended mere dyadic relationships, extending its significance to multi-tier or diversified supply chain associations. This implies that the impact of buying firms' leadership behaviors isn't confined solely to tier-1 suppliers; it has the potential to ripple through various tiers. The selection of leadership styles by buying firms can exhibit considerable variation over time and across different suppliers, contingent upon contextual and socio-economic factors. Furthermore, the leadership styles of buying firms are intricately linked to the degree of their suppliers' reliance on them. To adeptly cater to the unique requirements of diverse suppliers and to seamlessly orchestrate overarching supply chain sustainability endeavors, buying firms should embrace a multifaceted and adaptable leadership style (Agi and Nishant, 2017; Gosling et al., 2017).

The conspicuous leadership demonstrated by purchasing firms plays a pivotal role in supporting various stakeholders' efforts to implement environmental sustainability strategies (Gabler et al., 2017). In simpler terms, buying firms bear the responsibility of not only initiating sustainability initiatives but also displaying essential leadership attributes such as motivation, control, auditing, and reward systems to ensure suppliers' compliance with these sustainability plans (Kurucz et al., 2017; Dubey et al., 2015). Comparable dynamics have been observed in the execution of sustainability initiatives by external logistics suppliers, highlighting the necessity for leadership and synchronization by the central firm (Centobelli et al., 2017). To evaluate the impact of leadership commitment on information technology and supply chain performance, this study concentrates on two categories of leaders or leadership styles: transformational and transactional leaders/leadership.

2.2.8 The Role of Leadership in Technology Adoption and Supply Chain Performance

The four key features that supply chain front-runners should possess in the era of information technology are:

i. **A Firm Understanding of Data and Systems Technologies**

In the intricate and ever-evolving landscape of contemporary business, organizations have unlocked the potential to unravel the enigmatic fabric of customer behavior through the strategic harnessing of data analytics and the meticulous collection of data via digital channels (Kreutzer, Neugebauer, and Pattloch, 2017). While chief supply chain officers need not don the mantle of IT experts, their possession of a profound comprehension of data acquisition, technology, and the complex nuances of analytics is nothing short of imperative. This wellspring of knowledge serves as the fulcrum upon which their capacity to adroitly navigate discussions and craft an innovative digital vision for their supply chain teams' hinges.

Supply chain leaders are tasked with immersing themselves in the complex intricacies of how pertinent platforms and processes are artfully interwoven into the organizational tapestry. This entails orchestrating the symphony of demand forecasting, mastering the choreography of inventory management programs, fine-tuning the harmony of sales and operations planning procedures, and seamlessly synchronizing the ballet of transportation management systems. Furthermore, it is incumbent upon these leaders not to skim the surface but to plunge into the profound depths of data originating from diverse sources. Above all, they must stand as beacons of decision-making, equipped with the knowledge and sagacity to make judicious choices that draw from the abundance of available data (Mihardjo et al., 2019).

ii. **An Influential and Collaborative Approach**

The era when supply chain leadership worked successfully in isolation is a thing of the past. The involvement of the chief supply chain officer now extends across various aspects of the business, encompassing the procurement of raw materials, product supply, manufacturing operations, logistics, and customer delivery (Büyüközkan and Göçer, 2018). Within the organization, it is crucial for supply chain leaders to engage in effective communication and

collaboration with the chief technology officer to determine suitable technologies and policies. Specifically, the chief supply chain officer must cooperate with the chief data officer to gain an understanding of the optimal methods for data capture and utilization. Moreover, interaction with the chief marketing officer is essential for comprehending how the supply chain can be oriented towards customer needs and driven by demand. Ultimately, this executive must establish connections with both internal stakeholders and external suppliers to foster collaboration (Fontoura and Coelho, 2020).

iii. **Cross-functional and global experience**

Companies are currently shifting their focus from hiring specialized individuals for the supply chain role towards seeking candidates with broader experience, capable of interacting with professionals from various business functions. In today's context, it is crucial for chief supply chain officers to possess a comprehensive understanding of multiple disciplines, including non-traditional fields such as sales, finance, and technology, in addition to conventional areas like procurement, manufacturing, and logistics (Choudhury et al., 2021). Moreover, familiarity with different countries and cultures is highly advantageous, as it instills an appreciation for diverse backgrounds, ideas, and approaches that hold immense value in the rapidly evolving business landscape.

iv. **The ability to develop new skills and train others**

In the contemporary realm, principal supply chain officers must remain attuned to the latest technologies, guaranteeing the seamless integration of digital skills and nurturing a digitally oriented workforce (Kreutzer, Neugebauer, and Pattloch, 2017). A common mistake made by companies is implementing a data management solution without adequately preparing the organization. Merely having tools is not enough to drive results; people must be developed and trained to utilize these tools effectively. Establishing internal programs to foster skill adoption across the supply chain is crucial. The chief supply chain officer should not be exempt from this

requirement, as the digitization of the supply chain should be driven by top management (Fontoura and Coelho, 2020).

Companies that reduce costs and increase market share through their digital supply chain strategy will reshape the competitive landscape (Kreutzer et al., 2017). Successful execution of this strategy entails collaborating with suppliers in new ways while allowing customer collaboration to drive innovation in products and services. By 2025, entirely new companies will be leveraging and, in some cases, mastering the operation of a digital supply chain on a global scale. Additionally, established companies will also transform their supply chain into a digital platform (Mihardjo et al., 2019). Supply chain leaders have been effective in optimizing results by managing suppliers, relocating manufacturing to low-cost areas, and improving logistics efficiency. However, these actions are insufficient in a world shaped by big data and analytics, emerging technologies, new skill requirements, and an increasingly volatile operating environment. To succeed and achieve digital supply chain effectiveness, a paradigm shift is necessary (Choudhury et al., 2021).

2.3 Theoretical Review

This section presents a review of the theoretical literature. Theoretically, the technology acceptance theory and the resource base view theory were reviewed to serve as the theoretical underpinnings of the study.

2.3.1 Technology Acceptance Theory

The Technology Acceptance Model (TAM), devised by Fred Davis in 1986, serves as a framework elucidating users' inclinations toward adopting information technologies (Davis, 1986). TAM posits that two pivotal variables, namely perceived usefulness and perceived ease of use, wield considerable influence over users' attitudes toward employing information technology and their actual utilization of

such systems (Davis, 1986). These variables are inherently linked to the design attributes of relatively novel information systems.

Research has underscored the momentous role of user resistance in deterring technology adoption as a prominent catalyst for non-adoption (Turner et al., 2010). This establishes a nexus between the Diffusion of Innovation (DoI) theory and the TAM framework, as TAM tackles the issue of user resistance by delving into various attitudes that may impact technology adoption.

TAM derives its foundation from the theory of reasoned action, which posits that behavior unfolds through a logical sequence of belief, attitude, and intention. The interconnections between perceived usefulness, perceived ease of use, attitude, and intentions have garnered substantial support within the information technology literature (Hsiao and Yang, 2011). In an organizational context, perceived usefulness pertains to the prospective user's subjective belief that employing a specific technology will enhance their performance, while perceived ease of use hinges on the anticipated level of effort requisite for technological application (Hsiao and Yang, 2011). This theory is valuable for analyzing user attitudes and their perceptions of usefulness. Users' attitudes contribute to their acceptance or resistance toward adopting the technology. The intention to use the system can be linked to the goals of increasing transparency and reducing costs, which are primary concerns in procurement (Sumak et al., 2011). Furthermore, it is essential for the technology to be aligned with legal regulations. The TAM can analyze this aspect through subjective norms, which influence individuals' behavior by considering statutory requirements (Sumak et al., 2011).

It is of paramount importance that technological systems align with organizational preferences and rationales. Moreover, it is imperative to recognize that individuals may exhibit resistance when confronted with technological modifications. Therefore, there is a pressing need to delve into the underlying reasons for such resistance and explore potential avenues for resolution. Leveraging the

Technology Acceptance Theory (TAM), it becomes feasible to thoroughly examine the attitudes and behaviors of implementation personnel and technology users embedded within the supply chain domain. This analytical framework furnishes invaluable insights into the dynamics of technology integration and utilization, thereby influencing supply chain performance positively.

2.3.2 Resource-Based View (RBV)

The resource-based view (RBV) serves as a managerial framework that was utilized to identify strategic resources capable of providing a firm with a comparative advantage. These resources can be leveraged by the firm to attain a sustainable competitive advantage. The seminal work by Barney (1991) is frequently referenced as a key contribution to the emergence of the resource-based view. According to RBV, firms possess heterogeneous resources, leading to the possibility of different strategies due to variations in resource composition. The RBV directs managerial focus towards the internal resources of the firm, such as leadership and information technology, to identify valuable assets, capabilities, and competencies that can yield superior competitive advantages. The enhancement of supply chain performance is attributed to valuable resources or bundles of resources, as asserted by Barney (1991) and Peteraf (2013).

The RBV provides a perspective through which the value creation of information technology (IT) in supply chain performance can be examined, emphasizing its indirect role. Effective supply chain management (SCM) seeks to synchronize the supply, production, and delivery processes (Lee et al., 2010). To achieve this, firms must harness the connectivity offered by the Internet to establish an inter-firm digital platform, facilitating real-time information sharing and enhancing resource coordination across the supply chain (Lee, 2014). The digital platform aids in establishing connections between separate resources owned by supply chain partners, transforming them into coexisting resource bundles

that respond to each other (Zhu and Kraemer, 2012). This aligns with the concept of creating resource synergy advocated by the RBV (Conner, 2011).

The key terms of the resource-based view theory The key terms are valuable, rare, inimitable, and non-substitutable.

Valuable (V): Resources are valuable if they provide strategic value to the firm. Resources provide value if they help firms exploit market opportunities or reduce market threats. There is no advantage to possessing a resource if it does not add to or enhance the value of the firm.

Rare (R): Resources must be difficult to find among the existing and potential competitors of the firm. Hence, resources must be rare or unique to offer competitive advantages. Resources that are possessed by several firms in the marketplace cannot provide a competitive advantage, as they cannot design and execute a unique business strategy in comparison with other competitors.

Imperfect Imitability (I): Imperfect imitability means making copies of or imitating the resources will not be feasible. Bottlenecks for imperfect imitability can be many: difficulties in acquiring resources, an ambiguous relationship between capability and competitive advantage, or the complexity of resources. Resources can be the basis of sustained competitive advantage only if firms that do not hold them cannot acquire them.

Non-Substitutability (N): The non-substitutability of resources implies that resources can't be substituted by another alternative resource. Here, competitors can't achieve the same performance by replacing resources with other alternatives.

Within the context of the supply chain, value can manifest in terms of revenue generation and cost reduction. Moreover, integrating different stages of the supply chain allows each partner to concentrate on their specific operations, eliminating the need to acquire redundant resources required by other stages. As a result, resource utilization increases while operational costs decrease. Achieving cost

reduction is further facilitated through resource synergy among horizontal partners (Lee, 2012). This study employs this theory to gain a deeper understanding of how a firm's internal resources, such as leadership and information technology, can be effectively utilized to attain a competitive advantage in supply chain performance.

2.4 Empirical Review

This section of Chapter Two presents relevant literature from previous studies related to the research topic. It encompasses existing literature on the adoption of information technology, supply chain performance, and the significance of leadership commitment. Asiedu (2017) conducted a study that explored the impact of information technology on supply chain relationships in Ghana, focusing on Shoprite Limited. The research specifically investigated the influence of information technologies on the organizational performance of Shoprite Ghana Limited, identified factors that enhance customer relationships at the company, and proposed guidelines for Ghanaian retail companies to enhance efficiency in their supply chain networks. The study employed a survey design and selected a sample size of 100 participants using purposive and simple random sampling techniques.

The research conducted by Agyapong-Mensah et al. (2019) demonstrated that the effective use of IT has the potential to enhance organizational performance, foster robust customer relationships, and establish a competitive edge. The study further highlighted that Shoprite Ghana's implementation of IT has resulted in enhanced customer care and satisfaction, bolstering the company's relationship with its clientele. The study concluded that Shoprite Ghana had already experienced some benefits from the limited use of IT in its operations but could potentially gain more by proactively addressing service delivery delays through IT implementation and strategically investing in IT to offer innovative products and services to customers.

The research conducted by Kaaria and Mwangani (2017) delved into the impact of information technology on supply chain performance in Kenyan public institutions. Their study specifically investigated the influence of electronic data interchange, e-tendering, supply chain integration, and enterprise resource planning on the overall supply chain performance within these institutions. The research employed a mixed-methods approach, combining qualitative and quantitative techniques. The target population consisted of 159 staff members from seven directorates in the Judiciary in Nairobi County. The study results indicated that electronic data interchange significantly influenced supply chain performance in the Kenyan judiciary ($\beta1 = 0.290$, p-value = 0.005). Furthermore, the research established that electronic tendering ($\beta2=0.263$, p-value=0.022), supply chain integration ($\beta3=0.102$, p-value=0.017), and enterprise resource planning ($\beta3=0.404$, p-value=0.000) all significantly influenced supply chain performance in the Kenyan Judiciary.

Awara et al. (2018) conducted a study that further explored the impact of information technology (IT) tools on the supply chain performance of online retailers in Calabar Metropolis, Cross River State. The research employed a cross-sectional survey design and utilized purposive sampling. Multiple regression analysis was conducted to analyze the data. The findings revealed that information technology (IT) tools had a positive influence on the supply chain performance of online retailers in Calabar Metropolis. The study has concluded that the customer is the starting point and endpoint of supply chain management. The primary objective of integrating and collaborating within the supply chain is to effectively meet customer demands, satisfy their needs, and add value to supply chain activities, ultimately enhancing performance. Therefore, it is crucial for online retailers to establish a robust supply chain integrated with information technology-enabled logistics systems, which can enhance supply chain performance and enable swift responses to unexpected consumer needs.

In their study, Aziz et al. (2020) delved into the impact of leadership style on employees' acceptance of technology within organizational contexts. Employing the Technology Acceptance Model (TAM), the study scrutinized the interplay between authentic leadership and users' perceptions of the utility and user-friendliness of technology, which, in turn, shapes their intentions to embrace technology. The data collected from 203 respondents employed in the Malaysian oil and gas sector was analyzed using multiple regression analysis with SPSS Statistics software.

The results revealed a positive correlation between authentic leadership style and perceived usefulness, as well as perceived ease of use. Furthermore, the study demonstrated that users' perceptions of usefulness and ease of use positively influenced their intention to use technology, thus corroborating previous research on TAM. These findings underscore the significance of authentic leadership style in effectively managing technological changes within organizations.

Kangeri (2021) also examined the relationship between leadership styles and technology adoption within organizations, an area that has received limited research attention. The study explored the predominant leadership styles among top management teams in publicly listed manufacturing companies, how these styles influenced technology adoption, and the utilization of adopted technological applications by the management team. The study specifically focused on transformational, transactional, and laissez-faire leadership styles. Primary data was collected through a self-administered questionnaire distributed to department heads and other senior management leaders of nine publicly listed manufacturing companies in Kenya. Employing a descriptive research design, the study revealed the existence of transformational leadership, transactional leadership (management by exception-passive), and some traces of laissez-faire leadership among the surveyed top leaders.

The study findings demonstrated that the surveyed leaders mostly belonged to the early majority category on the technological adoption spectrum. The study revealed a consensus among the

participants regarding the benefits of technology integration in supporting their management functions. Based on these findings, it is recommended that both manufacturing companies and other organizations' top management teams take the lead in investing in, adopting, and utilizing relevant technologies. This strategic approach would have a positive impact on optimizing operational capacity, efficiency, and profitability and ultimately contribute to long-term sustainable growth for these organizations (Hashemi et al., 2022).

Hashemi et al. (2022) contributed to the literature by investigating the impact of supply chain challenges and supply chain performance on the operational effectiveness of nonprofit organizations. The study also shed light on the role played by supply chain integration and management commitment in influencing the performance outcomes of these nonprofit entities. One hundred questionnaires were distributed to managers at various levels within nonprofit organizations in Afghanistan. Among the distributed questionnaires, 55 were completed and returned, resulting in a response rate of 55%. To analyze the data, a quantitative approach was employed using the SmartPLS application.

The study revealed that the incorporation of supply chain metrics, encompassing information sharing, planning, control, and coordination of materials, as well as commitment across all three levels of management, exerted a favorable impact on supply chain performance. Moreover, the research identified that hurdles such as government regulations, customer demands, and performance indicators such as supply chain delivery flexibility, responsiveness time to customers, and inventory costs had a significant influence on the performance of nonprofit organizations.

2.5 Conceptual Framework

This section depicts a pictorial view of the study's variables and constructs. The independent variable is information technology adoption, which affects supply chain performance (the dependent

variable), with the moderating role of leadership commitment affecting the relationship between information technology adoption and supply chain performance.

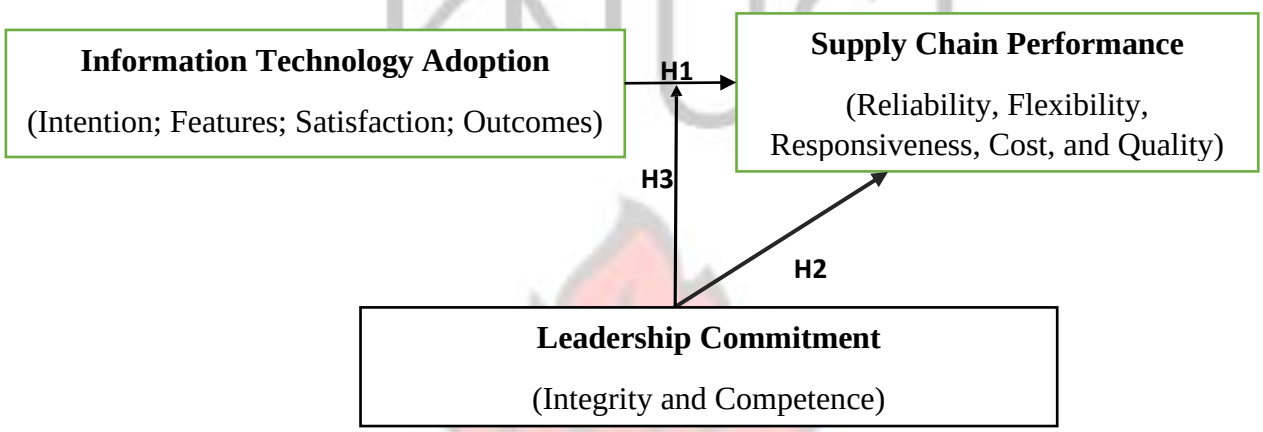

Figure 2.1 Conceptual Framework *Source: Researcher's own construct*

2.6 Hypothesis Development

2.6.1 Information Technology on Supply Chain Performance

The adoption of information technology (IT) within the supply chain has emerged as a pivotal factor shaping supply chain performance. Integrating communication technologies between suppliers, retailers, and organizations has been emphasized in studies such as Christopher's (2016), underscoring the transformative potential of information technology (IT) in revolutionizing conventional supply chain operations. IT empowers data sharing, facilitates real-time information exchange, and enhances communication across supply chain stakeholders, both internal and external. In a similar vein, Wang, Rodrigues, and Evans (2015) emphasized the substantial potential of IT in enhancing the capabilities of retail entities. It enables the acquisition, processing, and exchange of transactional information, fostering improved collaboration, synchronization, and communication across the entire supply chain, from suppliers and manufacturing units to distribution centers, wholesalers, retailers, and customers.

Mangiaracina, Melacini, and Perego's (2012) investigation into small and medium-sized enterprises (SMEs) within the grocery retail sector reveals that IT serves as a catalyst for integrating supply chain activities. It opens new avenues for fortifying relationships with suppliers and customers. Aligning with Christopher's insights (2016), IT tools offer significant potential for enhancing supply chain performance by tailoring and adapting to the dynamic business ecosystem. This adaptability aids in harmonizing planning activities across various supply chain operations. The evolution of information technology adoption within supply chains has been rapid over the years (Tan et al., 2012).

In response to intensifying competition, companies have employed novel strategies to enhance supply chain efficiency through increased integration. In this context, IT emerges as a pivotal enabler of supply chain management, facilitating seamless information dissemination while addressing operational challenges arising from various factors. The transformative impact of technology within supply chain management is evident through its role in mitigating the bullwhip effect, reducing inefficiencies, and subsequently lowering costs, lead times, and maintaining product quality. The deployment of robust IT infrastructure and customized information-sharing systems serves to mitigate inherent uncertainties in supply chain management (Llach and Alonso-Almeida, 2015).

An essential aspect of effective supermarket supply chain management lies in the role of information sharing among stakeholders. The digital medium serves as a linchpin for sustaining a competitive edge within the industry (Rao, 2015). Strategic management of information sharing has emerged as a pivotal driver for cultivating and maintaining competitive advantages. This necessitates a focused approach to planning and implementing information sharing processes, supported by technology, to orchestrate desirable outcomes. The collaborative framework within superstore supply chains, encompassing retailers, manufacturers, and distributors, is navigating a promising yet intricate

phase. Stakeholders acknowledge the value of close collaboration in enhancing operational efficiency and service benchmarks (Oyebiyi et al., 2017).

While the significance of IT in this domain is evident, existing studies underscore the importance of assimilating IT into organizational culture and recalibrating workflows to leverage competitive advantages. Contemporary literature underscores the positive implications of IT on various facets of the supply chain, including reduced production uncertainties, optimized inventory levels, streamlined logistics, and refined procurement processes (Majchrzak et al., 2016). Moreover, diverse studies acknowledge the extensive impacts of ICT implementation within supply chain management (SCM), resonating through aspects like price, quality, and lead-time considerations. Flourishing enterprises are realigning their structures to harness the potential of information technology, reshaping operational methodologies, and consequently offering a wider range of superior, reasonably priced products, ultimately benefiting end consumers (Mangiaracina et al., 2012). Consequently, it can be inferred that

H1: Information technology adoption significantly influences supply chain performance.

2.6.2 The Role of Leadership Commitment on Supply Chain Performance

Leadership commitment has been recognized as a crucial element in the performance of supply chains (Gosling et al., 2017). The commitment demonstrated by leaders can significantly impact resource allocation, organizational support, and employee engagement levels (Agi and Nishant, 2017). Numerous studies have indicated a positive correlation between leadership commitment and supply chain performance. For instance, Jeyaraj et al. (2006) discovered a positive association between leadership support and supply chain management. In a similar vein, Zhang et al. (2011) revealed that leadership support was positively linked to supply chain management. Furthermore, studies conducted in other sectors, such as healthcare (Kirsch et al., 2014) and logistics (Xie et al., 2014), have also found

that leadership commitment can lead to enhancements in supply chain performance. Therefore, the second hypothesis formulated in that is:

H2: Leadership commitment has an impact on supply chain performance.

2.6.3 The Moderating Role of Leadership Commitment on the Relationship between Information Technology Adoption and Supply Chain Performance

Leadership commitment has influenced supply chain performance through various means. Firstly, it has affected resource allocation for IT adoption initiatives. Organizations that are committed to IT adoption are more inclined to allocate resources for the development and implementation of IT systems (Smith et al., 2017). Secondly, leadership commitment has influenced the level of organizational support for IT adoption initiatives. Organizations that prioritize IT adoption have provided the necessary support and infrastructure to ensure the success of these initiatives (Gunasekaran et al., 2017). Lastly, leadership commitment has impacted the degree of employee engagement in IT adoption initiatives by perceiving strong commitments from top management to their successes (Xie et al., 2014).

According to Agi and Nishant (2017), leadership commitment in IT adoption and supply chain management serves several purposes:

Driving Change: This has been one of the critical roles of leadership commitment in IT adoption and supply chain performance. Leaders have pushed for improvements in the existing processes by creating a sense of urgency for the adoption of IT solutions. They have communicated the importance of IT adoption and the benefits it will bring to the organization, such as improved efficiency, reduced costs, and better customer service. Leaders, therefore, have motivated their teams to work towards IT adoption and have overcome resistance to change (Agi and Nishant, 2017).

Resource Allocation: Another critical role of leadership commitment identified was resource allocation. Leaders have allocated the necessary resources, including finances, time, and personnel, to ensure the success of the IT adoption process. This involved making sure that there is adequate funding to support the adoption process and assigning the right people with the necessary skills and expertise to manage the project (Agi and Nishant, 2017).

Setting Goals: Leadership commitment was also found to be crucial in setting goals for the IT adoption process. Leaders had a clear understanding of the business objectives and how the IT solution would help achieve them. They set realistic and measurable goals for the adoption process and communicated them clearly to all stakeholders. This helped to create a shared vision and align the efforts of members toward achieving the goals (Agi and Nishant, 2017).

Monitoring Progress: Agi and Nishant (2017) mentioned that leadership commitment was necessary for monitoring progress throughout the IT adoption process. Leaders regularly reviewed the progress of the adoption process and took corrective action if necessary. This involved identifying all obstacles or issues that may have arisen and addressing them promptly and accurately. By doing so, leaders ensured that the adoption process stayed on track and the objectives were achieved.

Overall, leadership commitment is essential for successful IT adoption in supply chain management. Leaders must play an active role in driving change, allocating resources, setting goals, and monitoring progress throughout the adoption process to ensure its success. Hence, the second hypothesis can be formulated as:

H3: Leadership commitment plays a significant moderating role in the relationship between IT adoption and supply chain performance.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter was concerned with the methods and techniques through which the research was conducted. They are discussed under the following headings: research design, population, sampling procedure, data collection instruments, data processing and analysis, and a summary of the chapter.

3.2 Research Design

In this study, the research design unfolded within the framework of a descriptive survey, exploring "Information Technology Adoption and Supply Chain Performance: The Role of Leadership Commitment." Rooted in the perspectives of scholars such as Amoani (2015) and Koul (2010), the descriptive survey design was chosen for its capacity to meticulously depict an ongoing scenario or real-life context, allowing for the derivation of accurate generalizations and meaningful conclusions from the uncovered facts. The selection of a descriptive research design was driven by the aspiration to attain a profound understanding of the specific case under investigation. This design facilitated the integration of both qualitative and quantitative methods and approaches, enabling a comprehensive exploration of the research phenomena. This inclusive approach leveraged the power of quantitative methods to collect numerical data, elucidate patterns, and control relevant variables, aligning with the insights of Fetters, Curry, and Creswell (2013).

Central to our methodological approach was the incorporation of the Explanatory Sequential Design. This design unfolded in distinct phases, commencing with the collection and analysis of quantitative data to probe the intricate relationship between Information Technology Adoption (ITA) and Supply Chain (SC) Performance. Surveys or structured questionnaires were employed to gather

numerical data, and quantitative analyses, including regression tests, were applied to assess statistical relationships. Following this quantitative phase, attention shifted to the interpretation of the findings, unraveling patterns that guided the subsequent qualitative exploration. This shift in analysis from quantitative to qualitative perspectives was a hallmark of the Explanatory Sequential Design. Through a meticulous examination of the quantitative results, specific questions or areas necessitating further exploration were formulated, setting the stage for the qualitative phase.

In the final phase, qualitative data collection and analysis were undertaken to provide a deeper understanding and explanation grounded in the insights gleaned from the quantitative exploration. Qualitative methods such as interviews or focus groups were employed to capture rich, contextual data. The analysis utilized qualitative data analysis techniques, including thematic analysis, to identify themes, patterns, or explanations contributing to a more profound comprehension of the intricate relationship between ITA, Leadership Commitment, and SC Performance. This integrated and sequential approach, encapsulated in the Explanatory Sequential Design, aimed to offer a nuanced and comprehensive understanding of the multifaceted dynamics at play in the realm of Information Technology Adoption and its impact on Supply Chain Performance, with a specific emphasis on the pivotal role of Leadership Commitment. Through this methodological lens, the study endeavored not only to unveil statistical relationships but also to provide practical insights and contextual understanding crucial for informed decision-making processes.

3.3 Population

The population of a research study is basically the collection of all possible individuals, objects, or measurements of interest to the researcher. Mugenda and Mugenda (2003) explained that the target population should have some observable characteristics, to which the researcher intends to generalize the results of the study. The target population of the study comprised staff and managers of SMEs

engaged in different types of business in La-Nkwantanang Madina Municipality, Accra. Even though there is no statistical data to show the exact number of SMEs in the La-Nkwantanang Madina area, it is estimated that there are about 5,000 small and medium-scale enterprises in the La-Nkwantanang Madina area, according to the Ghana Statistical Service, 2010 Population and Housing Census (page 40).

3.4 Sampling Procedure and Sample Size

A purposive sampling approach was employed to select the participants. This method, as described by Patton (2002), falls under the category of non-probability sampling. It involves the researcher making deliberate choices about which individuals to include in the sample based on various criteria. These criteria could encompass specialized knowledge relevant to the research topic or the willingness and ability of individuals to participate in the study. In this study, a purposive sampling technique was employed to specifically target the population, focusing on gathering insights from staff members. These insights centered on the moderating role of leadership commitment in the context of information technology adoption and supply chain performance within SMEs in Ghana.

A sample refers to a subset of the larger population under investigation. It consists of selected members drawn from the population. Samples are used to gather information from a portion of the group, allowing researchers to make inferences about the entire population. In accordance with this principle, the sample size for this study was determined utilizing the sample size determination formula presented by Yamane (1967), which is:

$$n = \frac{N}{1 + N\,(e)^2}$$

Where: n = Sample Size N = Population size e^2 = Margin of error (at a confidence level of 95%; thus, margin of error (e) is 0.05.

Sample size calculation

$$n = \frac{5{,}000}{1 + 5{,}000\,(0.05)^2}$$

Therefore, sample size = 370.

3.5 Data Collection Instruments

In this research, the primary data were collected using questionnaires as the principal data collection instrument. Questionnaires offer several advantages, as outlined by Bacon-Shone (2015). They are cost-effective and relatively simple to administer compared to personal interviews. Moreover, questionnaires are well-suited for group administration and preserving respondent confidentiality. The questionnaires employed in this study were structured, consisting of closed-ended questions. The questionnaire was divided into five sections, with the initial section dedicated to gathering respondents' demographic information. The subsequent sections focused on each of the critical variables investigated in the study. The measurement of all constructs within the surveys was conducted using a Likert scale. The respondents were asked to indicate the extent to which they agree or disagree with each statement by checking the appropriate number from 1 to 7, using the scale: 1= Strongly disagree 2=Disagree 3= Somewhat disagree 4= Indifferent/Not sure 5= Somewhat agree 6= Agree 7= Strongly agree.

Section A	**Biographic data of respondents**
Section B	**Information Technology Adoption** (Source: Lin & Ho, 2009).
Section C	**Supply Chain Performance (**Source: Chatterjee, Chaudhuri & Vrontis, 2022; Hashemi et al., 2022).

Section D	**Leadership Commitment (**Source: Chatterjee, Chaudhuri & Vrontis, 2022; Hashemi et al., 2022).

Table 3.1: Table showing different sections of questionnaire

3.6 Data Collection Procedure

Prior to the commencement of data collection, the researcher engaged with SMEs by visiting their business premises for a preliminary discussion regarding their enterprises. During these interactions, the researcher introduced the study's objectives and purpose. A mutually convenient date and time for data collection were scheduled in coordination with the SME representatives. Before the distribution of questionnaires, participants received a comprehensive briefing about the research's goals and were provided with assurances of the confidentiality of their responses. Subsequently, with the participants' informed consent, questionnaires were administered in their respective workplace settings.

3.7 Data Processing Technique

The data acquired underwent a meticulous processing procedure to ensure its quality, reliability, and appropriateness for analysis. Following the collection of questionnaires, a comprehensive validation process was employed to address any inconsistencies or inaccuracies. This was achieved through dialogue with participants or predetermined criteria. The data collected during the final phase of data collection underwent analysis using the Statistical Package for the Social Sciences (SPSS) version 22 and Microsoft Excel. This analysis involved careful transcription, coding, and transformation of data. The results were presented using descriptive statistical tools such as graphs, tables, and measures of central tendency.

The descriptive statistical analysis encompassed the calculation of means, medians, and measures of dispersion for variables. Visual representations, including tables, were utilized to illustrate

distributions and trends. A quality assurance approach was implemented to identify discrepancies and outliers, thereby ensuring the integrity of the data. Measures were taken to prioritize privacy and confidentiality, including the removal of personal identifiers. Adherence to ethical considerations and data security standards was of paramount importance.

In essence, the data processing in this study included validation, cleaning, entry, coding, transformation, and preparation. Descriptive analysis and graphical representations were applied to guarantee accuracy, reliability, and ethical compliance.

3.8 Validity and Reliability

Validity pertains to the extent to which a research instrument accurately captures the intended data. According to Mugenda and Mugenda (2014), validity involves the correctness and significance of drawing conclusions based on study outcomes. In this research, the validity of the employed instruments was evaluated through content and face validity. Fellow colleagues reviewed the instruments to ensure their alignment with the research objectives. The research tools were further refined based on input from the supervisor, aligning them more effectively with the study's aims. This iterative process led to the utilization of standard questionnaires for data collection.

Reliability, on the other hand, refers to the extent to which an exact measurement remains consistent across repeated instances. To ensure reliability, a pilot study was conducted on the research subjects to gauge their responses to the research instruments. Prior to the main study, a pre-testing phase involving twenty randomly selected SME owners in the Adentan Municipality was undertaken to establish the validity of the tools. The instrument's internal consistency was assessed with a reliability coefficient assumed to be 0.70. As suggested by Van Griethuijsen et al. (2014), alpha values exceeding 0.70 indicate satisfactory internal consistency.

3.9 Ethical Considerations

Ethical protocols in research primarily intend to safeguard participants from potential harm or adverse consequences (Huberman and Miles, 2014). In this study, several ethical strategies were implemented. Informed consent was obtained from participants, ensuring they were fully aware of all relevant aspects of the research before deciding to participate. Confidentiality and anonymity were maintained as respondents' identities and responses were safeguarded unless their informed consent was granted. In adherence to ethical standards, proper acknowledgment of sources was ensured to prevent plagiarism.

3.10 Profile of SMEs in La-Nkwantanang Municipality

The National Board for Small Scale Industries (NBSSI), responsible for nurturing SME growth in Ghana, employs both employee count and fixed asset value to categorize enterprises. According to Quainoo (2011), small enterprises employ 6 to 29 workers and possess fixed assets of $100,000; medium enterprises employ 30 to 99 workers and have fixed assets up to $1 million. This study aligns with the World Bank's enterprise survey definition of SMEs: small (5 to 19 employees), medium (20 to 99 employees), and large (more than 99 employees).

CHAPTER FOUR

ANALYSIS OF DATA AND PRESENTATION OF RESULTS

4.1 Introduction

This chapter focused on the analysis and discussion of primary data obtained from closed-ended questionnaires administered on the topic of “Information Technology Adoption and Supply Chain Performance. The Role of Leadership Commitment" The engagement of leadership commitment within the field and the resulting dataset played a pivotal role in achieving the study's objectives. For data entry and processing during the assessment, IBM SPSS version 22 and Microsoft Excel 2019 were used. Particularly, IBM SPSS 22 facilitated data analysis, while Microsoft Excel 2019 facilitated data visualization in the form of tables. The statistical tools included one-sample t-tests, mean, standard deviation, and p-value tests, as well as descriptive statistics, particularly frequencies and comparing means. By incorporating tables, the discussion of the results was enhanced. Furthermore, a reliability test, particularly Cronbach Alpha's reliability test, was performed to improve the rigor of the study.

4.2 Response Rate

A total of three hundred and seventy-two (372) questionnaires were administered to respondents over Google Forms, which served as an online avenue for collecting data. Out of 372, all of them were usable, as all questions on the form were set to "required." This led to a success rate of 100 percent (100%).

4.3 Demographic Characteristics

Gender Distribution: An analysis of the gender distribution reveals a notable pattern among the respondents. Specifically, 216 individuals (58.1%) identify as male, while 156 individuals (41.9%) identify as female.

Age Distribution: Examining the age distribution, the dataset reflects a diverse range of age demographics. The largest segment fell within the 30- to 35-year-old category, constituting 109 respondents (29.3%). The age bracket of 36 to 40 years closely follows, encompassing 102 respondents (27.4%). Additionally, the distribution includes 89 respondents (23.9%) aged 24 to 29 years, 60 respondents (16.1%) aged 41 years and above, and 12 respondents (3.2%) aged 23 years and below.

Educational Background: Delving into educational qualifications, the dataset showcased a diverse array of educational backgrounds. Specifically, 189 respondents (50.8%) hold a bachelor's degree, while 132 respondents (35.5%) possess a master's degree. Additionally, 33 respondents (8.9%) held a PhD or doctorate degree, and 18 respondents (4.8%) have a secondary education background.

Department Affiliation: A comprehensive look at departmental affiliations underscores the professional diversity of the participants. The logistics department stands out, constituting 100 respondents (26.9%). The management department and the IT department closely follow, with 61 respondents (16.4%) and 86 respondents (23.1%), respectively. The broader distribution also encompasses contributions from departments such as procurement, operations, finance, and others, collectively forming the overall representation. In a firm's operational years ("Information technology adoption and supply chain performance: the role of leadership commitment"), a diverse range of operational experiences becomes evident. Notably, 131 respondents (35.2%) indicate that their firms have been operational for 16 to 20 years, followed by 82 respondents (22.0%) with 11 to 15 years of operational history. Additionally, 80 respondents (21.5%) indicate they are 21 years and older, while

37 respondents (9.9%) have an operational history of 6 to 10 years. 32 respondents (8.6%) and 10 respondents (2.7%) represent firms with 1 to 5 years and less than 1 year of operational experience, respectively.

Ownership Type: Within the sphere of "Information Technology Adoption and Supply Chain Performance, "the role of leadership commitment" and the ownership type of participating firms emerge as defining characteristics. 299 respondents (80.4%) indicate that their firms were totally owned locally, while 61 respondents (16.4%) represent firms that were partly Ghanaian and partly internationally owned. A smaller subset of firms, 12 respondents (3.2%), specified that they were totally owned internationally.

Industry Firm Belongs to: Analyzing the industries to which the participating firms belong, a diverse landscape of industry representation came to light. Notably, the logistics industry constitutes a significant portion, encompassing 191 respondents (51.3%). The technology industry followed with 73 respondents (19.6%), and the finance industry contributed 36 respondents (9.7%). Other industries, including manufacturing, the food processing industry, and more, collectively formed the remaining distribution, showcasing the multi-sectoral scope of the study.

Number of Employees: Within the context of the study's exploration, a detailed analysis of the number of employees within the participating firms revealed noteworthy insights. Specifically, 238 respondents (63.9%) indicate that their firms employed more than 50 employees, underscoring the diverse size range of firms. Furthermore, 82 respondents (22.0%) represent firms with 30 to 50 employees, while 34 respondents (9.1%) and 14 respondents (3.8%) represent firms with 10 to 29 employees and 6 to 9 employees, respectively. A smaller subset, 4 respondents (1.1%), indicate that their firms had less than 6 employees.

Annual Revenue: Lastly, delving into the financial aspect, the annual revenue of participating firms underscores their economic scope. Specifically, 249 respondents (67.0%) reported exceeding $1,000,000 in annual revenue. Moreover, 102 respondents (27.4%) represent firms with annual revenues between 500,000 and 1,000,000, while 21 respondents (5.6%) indicated less than 500,000 in annual revenue.

Below is **Table 4.1** showing the various demographics of the responses from the questionnaire.

Gender		
	Frequency	**Percentage (%)**
Male	216	58.1
Female	156	41.9
Total	372	100.0

Age		
	Frequency	**Percentage (%)**
23 years and below	12	3.2
24-29 years	89	23.9
30-35 years	109	29.3
36-40 years	102	27.4
41 years and above	60	16.1
Total	372	100.0

Educational Background		
	Frequency	**Percentage (%)**
Secondary	18	4.8
Bachelor's Degree	189	50.8
Master's Degree	132	35.5
PhD/Doctorate	33	8.9
Total	372	100.0

Belonging Department		
	Frequency	**Percentage (%)**
Logistics	100	26.9
Management	61	16.4
Procurement	26	7.0
IT	86	23.1
Operations	25	6.7

Finance	48	12.9
Other	26	7.0
Total	372	100.0

Position In Firm

	Frequency	Percentage (%)		Frequency	Percentage (%)
Operations Manager	8	2.2	Internal Audit Consultant	1	0.3
Logistics Assistant	6	1.6	Sales Executive	2	0.5
Senior Manager	2	0.5	Head of Tech	1	0.3
Shippers Authority	1	0.3	Head of Purchasing	1	0.3
Procurement Officer	7	1.9	MCA	1	0.3
Warehouse Manager	14	3.8	Head of Logistics	4	1.1
Logistics & Clearing	1	0.3	Inventory Officer	1	0.3
Procurement Manager	6	1.6	Executive Assistant	4	1.1
Chief Security	1	0.3	Account Executive	1	0.3
Chief Executive Officer	15	4.0	Finance Officer	3	0.8
IT Assistant	3	0.8	Sales Analyst	1	0.3
Chief Accountant	1	0.3	Decision Support Specialist	1	0.3
Supervisor	4	1.1	Research Assistant	1	0.3
Developer	1	0.3	Accounts Officer	1	0.3
Assistant Director	1	0.3	Head of Procurement	3	0.8
Secretary	11	3.0	Assistant Manager	1	0.3

Senior Software Developer	1	0.3	Operations Manager	1	0.3
Transport Officer	13	3.5	Senior Developer	1	0.3
Software Engineer	7	1.9	Support Analyst	1	0.3
Frontend Engineer	1	0.3	IT Technician	3	0.8
Administrative Assistant	4	1.1	Inventory Manager	3	0.8
IT Manager	3	0.8	Web Developer	1	0.3
Driver	5	1.3	Quality Assurance Specialist	2	0.5
Operations Assistant	1	0.3	IT Coordinator	1	0.3
Accountant	19	5.1	Warehouse Clerk	4	1.1
IT Operator	2	0.5	Computer Scientist	8	2.2
Personal Assistant	2	0.5	Procurement Coordinator	1	0.3
Managing Director	3	0.8	Business Planner	1	0.3
Chief Procurement Officer	1	0.3	Operations Coordinator	2	0.5
Organizer	3	0.8	Warehouse Supervisor	1	0.3
Tech Assistant	1	0.3	Senior Manager	2	0.5
Project Manager	3	0.8	Human Resource Manager	2	0.5
Treasurer	1	0.3	Chief Operating Officer	1	0.3
Loan Officer	4	1.1	Senior Developer	1	0.3
Credit Manager	1	0.3	Director	3	0.8
Auditor	4	1.1	Administrative Coordinator	2	0.5
Business Developer	1	0.3	Inventory Coordinator	2	0.5

Controller	1	0.3	Accounting Assistant	1	0.3
IT Specialist	4	1.1	Project Officer	2	0.5
Account Manager	2	0.5	Office Manager	1	0.3
Software Engineer	3	0.8	Public Relations Officer	1	0.3
Manager	3	0.8	Scheduler	1	0.3
Data Analyst	9	2.4	Foreman	2	0.5
Secretary	1	0.3	Sales Consultant	1	0.3
Developer	2	0.5	Teacher	1	0.3
IT Analyst	1	0.3	Marketing Director	1	0.3
Credit Controller	4	1.1	Senior Developer	1	0.3
Finance Controller	2	0.5	Geologist	1	0.3
Business Analyst	3	0.8	Product Manager	1	0.3
Logistics Specialist	3	0.8	Head of Operations	1	0.3
Credit Officer	2	0.5	Office Assistant	1	0.3
Procurement Assistant	2	0.5	Credit Clerk	1	0.3
Administrator	2	0.5	Network Engineer	4	1.1
Dispatch Rider	8	2.2	Systems Engineer	1	0.3
Logistics Officer	4	1.1	Software Developer	4	1.1
National Service Personnel	2	0.5	Supply Chain Lead	1	0.3
Purchasing Officer	1	0.3	Data Scientist	6	1.6
Operations Analyst	2	0.5	Field Officer	1	0.3
Sales Assistant	1	0.3	Programme Manager	1	0.3
Finance Assistant	2	0.5	Data Engineer	1	0.3

Personal Assistant	3	0.8	Delivery Coordinator	1	0.3
Shipping Officer	1	0.3	Systema Analyst	1	0.3
Facilities Manager	3	0.8	Consultant	5	1.3
Head of Claims	1	0.3	Quantity Surveyor	1	0.3
Cyber Security Analyst	5	1.3	Head of Sales	1	0.3
Logistics Manager	1	0.3	Security Officer	1	0.3
Business Specialist	1	0.3	IT Support	2	0.6
Research Assistant	1	0.3	Customer Service	4	1.1
Cashier	1	0.3	Storehouse Clerk	1	0.3
Branch Manager	4	1.1	Support Specialist	1	0.3
Assistant Pharmacist	1	0.3	**Total**	372	100

Firm's Operational Years		
	Frequency	**Percentage (%)**
Less than 1 year	10	2.7

Number Of Employees		
	Frequency	**Percentage (%)**
Less than 6 employees	4	1.1
6-9 employees	14	3.8

1-5 years	32	8.6
6-10 years	37	9.9
11-15 years	82	22.0
16-20 yeas	131	35.2
21 years & above	80	21.5
Total	372	100.0

10-29 employees	34	9.1
30-50 employees	82	22.0
More than 50 employees	238	63.9
Total	372	100.0

Ownership Type		
	Frequency	**Percentage (%)**
Totally owned locally	299	80.4
Totally owned internationally	12	3.2
Partly Ghanaian & Partly Internationally owned	61	16.4
Total	372	100.0

Annual Revenue		
	Frequency	**Percentage (%)**
Less than 500,000	21	5.6
500,000 - 1,000,000	102	27.4
Above 1,000,000	249	67.0
Total	372	100.0

Industry Firm Belongs To		
	Frequency	**Percentage (%)**
Logistics	191	51.3
Technology	73	19.6
Food Processing Industry	9	2.4
Manufacturing	22	5.9

Finance	36	9.7
Other	41	11.0
Total	372	100.0

Table 4.1: Table showing the demographics of the responses from questionnaire

4.4 Descriptive Statistics of Measures Used

T**able 4.2 below represents descriptive statistics on information technology adoption** with the Sample-T test. Based on the findings of the statement "Computers enhance the supply chain (SC) performance of small and medium-sized enterprises (SMEs)," the used Likert scale generated a calculated mean of 6.540. This calculation indicates that respondents agree with the assumption that computers improve the supply chain performance of SMEs.

The assessment of the results using the Likert scale yields a computed mean of 6.355 for the statement "Internet connectivity helps to improve the supply chain (SC) performance of small and medium-sized enterprises (SMEs)." This result reveals that respondents agree that Internet access serves a beneficial role in improving the SC performance of SMEs.

According to the Likert scale used, the analysis of the data yields a computed mean of 6.140 for the statement "Smartphones help to improve the supply chain (SC) performance of small and medium-sized enterprises (SMEs)." This result indicates that respondents agree that cellphones do contribute to improving the SC performance of SMEs.

Utilizing the Likert scale, the analysis of the data reveals a calculated mean of 6.460 for the statement "Information technology adoption is directly linked to supply chain (SC) performance." This result implies that respondents agree that the adoption of information technology is directly related to supply chain performance.

The analysis of the findings, using the applicable Likert scale, yields a computed mean of 6.374 for the statement "The adoption of information technology in small and medium-sized enterprises (SMEs) has a positive influence on their supply chain (SC) performance." This implies that respondents agree that employing information technology within SMEs has a positive influence on their supply chain performance.

According to the adopted Likert scale, the results show a computed mean of 1.973 for the statement "The adoption of information technology in small and medium-sized enterprises (SMEs) has no influence on their supply chain (SC) performance." This indicates that respondents strongly disagree with the assumption that incorporating information technology into SMEs has no effect on their supply chain performance.

The Likert scale analysis of the data yields a computed mean of 6.245 for the statement "The supply chain unit of small and medium-sized enterprises (SMEs) cannot achieve their maximum output without the adoption of information technology." This suggests that respondents agree that the use of information technology is vital for SMEs' supply chain units to achieve maximum output.

The analysis of the findings using the Likert scale indicates a computed mean of 2.202 for the statement "A very good supply chain (SC) performance is very possible without information technology adoption." This suggests that respondents believe that getting extremely strong supply chain performance is difficult without the use of information technology.

INFORMATION TECHNOLOGY ADOPTION

No.	Statement	Min	Max	Mean	Std. Deviation
1	Computers enhance the SC performance of SMEs	1.00	7.00	6.540	.847

2	Internet connectivity helps to improve the SC performance of SMEs	1.00	7.00	6.355	.691
3	Smart phones help to improve the SC performance of SMEs	1.00	7.00	6.140	1.029
4	Information technology adoption is directly linked to SC performance	1.00	7.00	6.460	.705
5	The adoption of information technology in SMEs has a positive influence on their SC performance	1.00	7.00	6.374	.85100
6	The adoption of information technology in SMEs has a no influence on their SC performance	1.00	7.00	1.973	1.408
7	The supply chain unit of SMEs cannot produce their maximum output without the adoption of information technology	1.00	7.00	6.245	.986
8	A very good SC performance is very possible without information technology adoption	1.00	7.00	2.202	1.554

Table 4.2: Table showing descriptive statistics on Information Technology Adoption

Table 4.3 below represents Descriptive statistics on Supply Chain Performance with the Sample –T Test. Given the analysis of the findings using the applicable Likert scale, a calculated mean of 6.476 is produced for the statement "Our use of technologies or practices to optimize storage space

has a positive impact on cost reduction." This implies that respondents agree that their firm's use of technology or methods to improve storage space efficiency has a positive influence on cost reduction.

In accordance with the evaluation of findings using the Likert scale, a computed mean of 6.382 is determined for the statement "Implementation of strategies or technologies minimizes equipment maintenance and downtime costs." This indicates that respondents agree with the notion that implementing techniques or technology results in lower equipment maintenance and downtime costs.

The computed mean of 6.290 is determined from the analysis of the data using the chosen Likert scale for the statement "We have established efficient systems to track and meet delivery deadlines." This indicates that respondents agree that their companies have effectively built methods to monitor and meet delivery deadlines.

Referring to the Likert scale, a computed mean of 6.245 is apparent for the statement "Our organization can quickly alter production capacity to meet changing requirements." It shows that respondents agree that their firm can quickly modify production capacity to meet changing needs.

As per the applied Likert scale, the analysis of the results demonstrated a computed mean of 6.323 for the statement "Our communication channels enable swift interaction with customers." This indicates that the respondents agree with the idea that the communication channels in place facilitate rapid interactions with customers.

The analysis of the findings using the Likert scale provided a computed mean of 6.134 for the statement "The time required to transition from product development to production is minimal. This shows that respondents agree that the time required to transition from product development to production is truly limited.

SUPPLY CHAIN PERFORMANCE

No.	Statement	Min	Max	Mean	Std. Deviation
1	Our use of technologies or practices to optimize storage space has a positive impact on cost reduction	1.00	7.00	6.476	.851
2	Implementation of strategies or technologies minimizes equipment maintenance and downtime costs	1.00	7.00	6.382	.738
3	We have established efficient systems to track and meet delivery deadlines	2.00	7.00	6.290	0.702
4	Our organization can quickly alter production capacity to meet changing requirements	1.00	7.00	6.245	.857
5	Our communication channels enable swift interaction with customers	2.00	7.00	6.323	.61300
6	The time required to transition from product development to production is minimal	1.00	7.00	6.134	1.030

Table 4.3: Table showing descriptive statistics on Supply Chain Performance

Table 4.4 below represents Descriptive statistics on Leadership Commitment with the Sample –T Test. By employing the Likert scale, the analysis of responses reveals that for the statement "Information technology adoption in the supply chain of small and medium enterprises (SMEs) is impossible without leadership commitment," the calculated mean is 6.110. This suggests that

respondents do not agree with the idea that integrating information technology into SMEs' supply chains is unattainable without dedicated leadership.

The statement "Leadership commitment is the only important variable in ensuring excellent supply chain performance in business organizations" received a mean score of 2.457 with a standard deviation of 1.853. This suggests general agreement on the importance of leadership commitment, though opinions vary to some extent.

Using the same Likert scale, the analysis indicates that the computed mean for the statement "Supply chain (SC) performance is largely influenced by leadership commitment" is 6.481. This implies that respondents concur with the notion that the commitment demonstrated by leadership has a substantial impact on supply chain performance.

Based on the analysis utilizing the Likert scale, the calculated mean is 6.591 for the statement "Leadership commitment is the key moderator between information technology adoption and supply chain (SC) performance." This demonstrates respondents' agreement that leadership commitment is pivotal in moderating the relationship between IT adoption and supply chain performance.

Furthermore, the analysis using the Likert scale shows that the computed mean for the statement "The relationship between information technology adoption and supply chain (SC) performance cannot successfully thrive without leadership commitment" is 6.605. This indicates respondents' alignment with the idea that the success of the relationship between IT adoption and supply chain performance is contingent upon leadership commitment.

Lastly, the assessment employing the Likert scale reveals a computed mean of 6.637 for the statement "The lack of leadership commitment can negatively affect information technology adoption and supply chain (SC) performance in business organizations." This underscores respondents'

agreement that insufficient commitment from leadership can have a negative impact on both IT adoption and supply chain performance within business organizations.

LEADERSHIP COMMITMENT

No.	Statement	Min	Max	Mean	Std. Deviation
1	Information technology adoption in the supply chain of SMEs is impossible without leadership commitment	1.00	7.00	6.110	1.205
2	Leadership commitment is the only important variable in ensuring excellent SC performance in business organizations.	1.00	7.00	2.457	1.853
3	SC performance is largely influenced by leadership commitment	1.00	7.00	6.481	0.918
4	Leadership commitment is the key moderator between information technology adoption and SC performance	2.00	7.00	6.591	0.669
5	Information technology adoption and SC performance relationship cannot successfully thrive without leadership commitment	1.00	7.00	6.605	0.571

6	The lack of leadership commitment can negatively affect information technology adoption and SC performance in business organizations	2.00	7.00	6.637	0.545

Table 4.4: Table showing descriptive statistics on Leadership Commitment

4.5 Reliability test

Table 4.5 shows that Information Technology Adoption had an alpha value of 0.743 with a given number of elements (8), Supply Chain Performance had an alpha value of 0.829 with a given number of items = 7, and Supply Chain Digitalization Leadership Commitment had an alpha value of 0.783 with 5 items. According to Taber (2018), the results collected reflect a good level.

Table 4.5: Cronbach Alpha Values

Constructs	Cronbach's Alpha	No of Items
SECTION B: INFORMATION TECHNOLOGY ADOPTION	.743	8
SECTION C: SUPPLY CHAIN PERFORMANCE	.829	6
SECTION D: LEADERSHIP COMMITMENT	.783	6

Table 4.5: Table showing Section B, C and D's Cronbach Alpha Values and Number of Items

4.6 Correlation Matrix

The provided correlation matrix outlined the connections involving the moderating variable "leadership commitment," the dependent variable "supply chain performance," and the independent variable "IT adoption." The matrix contains Pearson correlation coefficients and corresponding p-values.

Information Technology Adoption and SC Performance: The correlation coefficient between IT adoption and supply chain (SC) performance is approximately 0.278. The significance level (p-value) is less than 0.001, indicating a statistically significant relationship. A positive correlation suggests that as IT adoption increases, supply chain performance tends to improve.

SC Performance and Leadership Commitment: The correlation coefficient between supply chain (SC) performance and leadership commitment is approximately 0.303. The significance level (p-value) is less than 0.001, indicating a statistically significant relationship. There is a positive correlation, with leadership commitment moderating the impact of IT adoption on SC performance.

Information Technology Adoption and Leadership Commitment: The correlation coefficient between IT adoption and supply chain (SC) performance is approximately 0.171. The significance level (p-value) is less than 0.01, signifying a statistically significant relationship. There is a weak positive correlation, with leadership commitment moderating the relationship between IT adoption and SC performance.

In summary, the correlation analysis revealed relationships among the variables. Leadership commitment appeared to moderate the connection between IT adoption and supply chain performance. Further exploration is recommended to better understand these interactions and dependencies. These findings provide valuable insights for potential research and analysis avenues.

		Information technology adoption is directly linked to SC performance	SC performance is largely influenced by leadership commitment	Leadership commitment is the key moderator between information technology adoption and SC performance
Information technology adoption is directly linked to SC performance	Pearson Correlation	1	.278**	.171**
	Sig. (2-tailed)		0	0.001
	N	372	372	372
SC performance is largely influenced by leadership commitment	Pearson Correlation	.278**	1	.303**
	Sig. (2-tailed)	0		0
	N	372	372	372
Leadership commitment is the key moderator between information technology adoption and SC performance	Pearson Correlation	.171**	.303**	1
	Sig. (2-tailed)	0.001	0	
	N	372	372	372

Table 4.6: A Table showing the correlation matrix of the various variables

4.7 Regression Analysis

A regression analysis from PROCESS Hayes Macro Model 1 was used to investigate how the level of leadership commitment may moderate the impact of IT adoption on supply chain performance. Regression analysis provides valuable insights into the complex interplay between IT adoption, supply

chain performance, and leadership commitment by quantifying these relationships, facilitating informed decision-making and deeper understanding within the context of supply chain management and leadership dynamics.

X = independent variable = ITA = Information Technology Adoption

Y = dependent variable = SCP = Supply Chain Performance

W = moderating variable = LC = Leadership commitment

4.7.1 Outcome Variable: SCP.

Model Summary

R	R-sq	MSE	F	df1	df2	p
.4715	.2223	.1648	34.5823	3.0000	363.0000	.0000

Table 4.7: A Table showing Model summary of outcome variable: Leadership commitment is the key moderator between information technology adoption and SC performance from regression analysis

The Model Summary provides crucial insights into the regression model's fit, revealing key statistical metrics for understanding the relationship between predictor variables and the outcome variable, Supply Chain Performance (SCP). The correlation coefficient (R) of 0.4715 indicates a moderate positive association, while the R-squared value (0.2223) signifies that 22.23% of SCP variance is explained by the model. The Mean Squared Error (MSE) at 0.1648 quantifies the average squared difference between actual and predicted SCP values, reflecting the model's accuracy. The F-statistic (34.5823) with degrees of freedom (df1, df2) at 3.0000 and 363.0000 respectively underscores the collective significance of predictor variables in explaining SCP. The low p-value (0.0000) reinforces the statistical significance of at least one predictor variable. These metrics collectively affirm

the model's robust fit, demonstrating its efficacy in capturing the nuances of the relationship between predictor variables and SCP.

Model

	coeff	Se	t	p	LLCI	ULCI
constant	-11.4718	3.3821	-3.3919	.0000	-18.1227	-4.8209
ITA	2.7615	.6349	4.3497	.0000	1.5130	4.0100
LC	2.9455	.5737	5.1344	.0000	1.8174	4.0737
Int_1	-.4515	.1073	-4.2096	.0000	-.6625	-.2406

Product terms key: Int_1 : ITA x LC

Table 4.8: A Table showing Model summary for ITA from regression analysis

Constant: The intercept, representing the estimated value of the outcome variable (SCP) when all predictor variables (ITA and LC) are zero, is -11.4718. The t-value of -3.3919 with a p-value of 0.0008 indicates that the intercept is significantly different from zero.

ITA (Information Technology Adoption): A one-unit increase in ITA is associated with a 2.7615-unit increase in SCP. The t-value of 4.3497 and a p-value of 0.0000 suggest that ITA is a statistically significant predictor.

LC (Leadership Commitment): A one-unit increase in LC is associated with a 2.9455-unit increase in SCP. The t-value of 5.1344 and a p-value of 0.0000 indicate that LC is a statistically significant predictor.

Int_1 (Interaction Term): The interaction term between ITA and LC (represented by Int_1) is -0.4515. This term accounts for the additional impact on SCP when ITA and LC interact. The negative coefficient suggests a dampening effect. The t-value of -4.2096 and a p-value of 0.0000 indicate that the interaction term is statistically significant.

Product Terms Key: The product term key explains that Int_1 is the interaction between ITA and LC, denoted as ITA x LC.

In summary, this model suggests that both ITA and LC individually have a positive and significant impact on SCP. The interaction term (ITA x LC) significantly contributes to the model, indicating that the combined effect of ITA and LC is not simply additive but involves an interaction that influences SCP.

Test(s) of highest order unconditional interaction(s):

	R2-chng	F	df1	df2	p
X*W	.0380	17.7211	1.0000	`363.0000	.0000
Focal predict: ITA (X)					
Mod var: LC (W)					

Table 4.9: A Table showing Test(s) of highest order unconditional interaction

R2-chng (R-squared Change): The change in R-squared due to the addition of the interaction term is 0.0380. This indicates the improvement in the proportion of variance in the outcome variable SCP) explained by including the interaction term in the model.

F-statistic (Test Statistic): The F-value is 17.7211, used to test the overall significance of adding the interaction term to the model.

Degrees of freedom (df1, df2): df1 is 1 and df2 is 363, representing the degrees of freedom ssociated with the numerator and denominator of the F-statistic, respectively.

p-value: The p-value is 0.0000, indicating that the test for the significance of the interaction term is statistically significant. In other words, the interaction between ITA and LC significantly contributes to explaining the variance in SCP.

Focal Predictors: The focal predictors involved in the interaction are ITA (denoted as X) and LC (denoted as W).

Conditional effects of the focal predictor at values of the moderator(s):

LC	Effect	se	t	P	LLCI	ULCI
5.5000	.2780	.0803	3.4623	.0006	.1201	.4359
5.8333	.1275	.0692	1.8439	.0660	-.0085	.2635
6.0000	.0523	.0701	.7459	.4562	-.0855	.1900

Table 4.10: A Table showing Conditional effects of the focal predictor at values of the moderator(s)

LC (Moderator - Leadership Commitment): The different levels of the moderator (LC) at which the conditional effects are assessed are 5.5000, 5.8333, and 6.0000.

Effect: This represents the estimated effect of Information Technology Adoption (ITA) on Supply Chain Performance (SCP) at each level of the moderator.

se (Standard Error): The standard error provides an indication of the precision of the estimated effect.

t (t-value): The t-value assesses whether the estimated effect is significantly different from zero. Higher t-values indicate greater significance.

p (p-value): The p-value tests the null hypothesis that the estimated effect is equal to zero. Smaller p-values suggest greater significance.

LLCI (Lower Limit of Confidence Interval): This is the lower boundary of the confidence interval for the estimated effect.

ULCI (Upper Limit of Confidence Interval): This is the upper boundary of the confidence interval for the estimated effect.

Explanation: For each level of the moderator (LC), the table presents the estimated effect of ITA on SCP along with associated statistical measures. At LC = 5.5000, the estimated effect is 0.2780, and it is statistically significant (p = 0.0006), suggesting a positive impact of ITA on SCP. At LC = 5.8333, the estimated effect is 0.1275, with a p-value of 0.0660, indicating a positive impact, but with a slightly lower significance. At LC = 6.0000, the estimated effect is 0.0523, and the p-value is 0.7459, suggesting a weaker and statistically non-significant impact.

These results provide insights into how the relationship between ITA and SCP varies at different levels of Leadership Commitment, offering a nuanced understanding of the conditional effects within the specified ranges of the moderator.

Analysis notes and errors

The level of confidence for all confidence intervals in output is 95.0000. The "W values" in conditional tables are the 16th, 50th, and 84th percentiles.

4.8 Hypothesis Testing:

Null Hypotheses (H0):

H0: There is no significant relationship between IT Adoption (ITA) and Supply Chain Performance (SCP).

H0: There is no significant relationship between Leadership Commitment (LC) and SCP.

H0: The interaction effect (Int_1) between ITA and LC is not significant.

Alternative Hypotheses (H1):

H1: There is a significant relationship between ITA and SCP.

H1: There is a significant relationship between LC and SCP.

H1: The interaction effect (Int_1) between ITA and LC is significant.

Significance Level (α): Set at 0.05.

Regression Coefficients:

For ITA: The coefficient is 2.7615, with a p-value < 0.05. Reject H0, indicating a significant positive relationship between ITA and SCP.

For LC: The coefficient is 2.9455, with a p-value < 0.05. Reject H0, suggesting a significant positive relationship between LC and SCP.

For Int_1: The coefficient is -0.4515, with a p-value < 0.05. Reject H0, indicating a significant interaction effect between ITA and LC on SCP.

R2-chng Test:

R2-chng is 0.0380 with a p-value < 0.05. Reject H0, indicating that the inclusion of the interaction term significantly improves the model.

Conditional Effects of ITA at Different Levels of LC:

LC at 5.5000: The effect is 0.2780 with a p-value < 0.05.

LC at 5.8333: The effect is 0.1275 with a p-value < 0.05.

LC at 6.0000: The effect is 0.0523 with a p-value > 0.05.

Conclusion:

The results suggest a significant positive relationship between IT adoption, leadership commitment, and supply chain performance. Additionally, the interaction effect between ITA and LC significantly influences SCP. The conditional effects of ITA at different levels of LC further highlight the moderating role of LC in this relationship.

4.9 Overview of Findings

The findings from the analysis underscore the substantial and positive contributions of both Information Technology Adoption (ITA) and Leadership Commitment (LC) to Supply Chain Performance (SCP). In isolation, each factor demonstrates a significant influence on SCP, suggesting that organizations stand to benefit from both robust IT adoption strategies and strong leadership commitment in their pursuit of supply chain optimization. However, the analysis goes beyond examining individual contributions and delves into the interactive dynamics between ITA and LC. The results reveal that the interaction between these two factors plays a pivotal role in enhancing the model's predictive power for SCP. This signifies that the combined effect of ITA and LC is not simply additive; rather, their synergy yields a more profound impact on supply chain outcomes. The inclusion of the interaction term, represented by Int_1, significantly improves the model's ability to explain variations in SCP, adding a layer of complexity to the understanding of the relationship between IT adoption and supply chain efficiency.

Furthermore, the investigation unveils an intriguing nuance in the relationship between ITA and SCP, dependent on the varying levels of LC. The conditional effects analysis highlights that the impact of ITA on SCP is contingent on the level of leadership commitment within the organization. Notably,

stronger effects are observed at lower levels of LC, indicating that the positive influence of ITA on SCP is particularly pronounced in settings where leadership commitment might be less prominent.

4.10 Discussion of Findings

This study, drawing insights from a diverse sample of 372 participants, elucidates the constructive impact of Information Technology (IT) adoption on the performance of supply chains (SC). A significant finding emerges with the identification of leadership commitment as a pivotal moderator, exhibiting positive correlations with both IT adoption and SC performance. The incorporation of nuanced perspectives and divergent views contributes to a more profound understanding of this intricate relationship, adding depth to the study's findings. Practical implications underscore the strategic significance of prioritizing both IT adoption and robust leadership commitment for organizations seeking to optimize supply chain outcomes, particularly in the ever-evolving landscape of contemporary business. This discussion aligns with the findings of relevant studies such as Amoani (2015) and Koul (2010), which emphasize the interconnectedness of IT adoption, leadership commitment, and supply chain performance. These studies underscore the need for organizations to strategically integrate technology while fostering strong leadership commitment to navigate the complexities of the modern business environment effectively.

4.10.1 Relationship between IT Adoption and SC Performance

The regression analysis explores the intricate relationship between Information Technology Adoption (ITA) and Supply Chain Performance (SCP), drawing insights from studies such as Premkumar and Roberts (1999), and Melville et al. (2004). The overall model fit, represented by an R-squared of 0.2223, signifies that 22.23% of SCP variance is explained. Notably, both ITA and

Leadership Commitment (LC) demonstrate positive and statistically significant coefficients, corroborating the findings of previous research. Specifically, the coefficient for ITA stands at 2.7615 (p-value < 0.0000), indicating a robust association between increased IT adoption and improved SCP. Similarly, the positive coefficient of 2.9455 (p-value < 0.0000) for LC reaffirms the positive correlation between heightened leadership commitment and enhanced SCP, aligning with insights from Sambamurthy et al. (2003). However, the introduction of the interaction term (Int_1) adds complexity, with a statistically significant negative interaction term (p-value < 0.0000) highlighting LC's moderating effect on the ITA-SCP relationship. Examining conditional effects at different LC levels reveals nuances in this moderation. At a lower LC level (5.5000), the conditional effect of ITA on SCP is 0.2780 (p-value = 0.0006), indicating a significant positive impact. However, as LC increases to 5.8333 and 6.0000, the conditional effects decrease (0.1275 and 0.0523, respectively), with diminishing statistical significance, aligning with the findings of Melville et al. (2004). In essence, these insights affirm that IT adoption independently contributes to SCP, with higher ITA associated with improved outcomes. The moderation effect of LC underscores its influence on the ITA-SCP relationship, emphasizing the amplified positive impact of ITA on SCP in the presence of strong leadership commitment, while acknowledging the nuanced negative moderation effect in certain conditions. This synthesis of research provides a vital perspective for organizations navigating the complexities of optimizing supply chain performance.

4.10.2 Leadership Commitment as a Key Moderator

Leadership Commitment (LC) emerges as a pivotal moderator in shaping the dynamic interplay between Information Technology Adoption (ITA) and Supply Chain Performance (SCP). Participants unequivocally assert the indispensable role of effective leadership commitment in ensuring the success of IT adoption initiatives and subsequently enhancing SCP. This perception aligns with established

literature and is reinforced by the statistical analysis, which discloses a significant and positive coefficient for LC (2.9455, $p < 0.0000$), indicating that heightened leadership commitment correlates with improved SCP. This finding resonates with the insights of Sambamurthy, Bharadwaj, and Grover (2003), highlighting leadership commitment's crucial function in aligning IT strategies with supply chain objectives, fostering innovation, and facilitating resource allocation. Leadership commitment is underscored as a linchpin in navigating the intricacies of IT integration, driving innovation, and promoting supply chain agility. Moreover, the external environment, shaped by industry characteristics and trading partners, significantly influences the impact of IT, with leadership commitment playing a central role in addressing industry-specific challenges and leveraging external factors. Participants emphatically agree that a deficiency in leadership commitment can adversely affect both IT adoption and SC performance, echoing the findings of Melville et al. (2004). In essence, while Leadership Commitment positively influences the ITA-SCP relationship, it's noteworthy that the negative interaction effect observed in the data suggests that, under certain conditions, this relationship may be weakened. This study underscores the strategic imperative of cultivating robust leadership commitment in tandem with IT adoption for organizations striving to optimize supply chain outcomes within a dynamic business landscape.

4.10.3 Impact of Leadership Commitment on IT Adoption and SC Performance

The regression analysis for Model 1, encompassing a sample size of 372, unveils intricate dynamics surrounding the influence of Leadership Commitment (LC) on both Information Technology Adoption (ITA) and Supply Chain Performance (SCP). The statistical significance of the relationship ($p < 0.0000$) emphasizes the substantive impact of LC in this context. In terms of IT Adoption, LC exhibits a robust and positive association, as indicated by the significant coefficient of 2.9455 ($p < 0.0000$). This finding resonates with the insights of Sambamurthy, Bharadwaj, and Grover (2003), highlighting

the pivotal role of leadership commitment in fostering a more pronounced acceptance and integration of information technology within organizational frameworks. Turning to the realm of Supply Chain Performance, the regression coefficients elucidate an independent positive effect of LC. With ITA held constant, a one-unit rise in LC corresponds to a 2.95-unit increase in SCP ($p < 0.0000$). This underscores LC as a fundamental driver of heightened supply chain performance, emphasizing its standalone significance in this context. The interaction term (Int_1) between ITA and LC further unveils LC's moderating role. With a coefficient of -0.4515 ($p < 0.0000$), this interaction effect delineates that under conditions of elevated LC, the positive impact of ITA on SCP is accentuated. Conversely, in situations of lower LC, this impact is notably subdued. The integration of insights from Melville et al. (2004) underscores the importance of leadership commitment in optimizing IT adoption, subsequently influencing supply chain performance by facilitating resource alignment, navigating complexities, and capitalizing on external influences.

4.10.4 The Interaction Effect: Leadership Commitment as a Moderator

The regression model (Model 1) examines the relationship between Supply Chain Performance (SCP) as the outcome variable, Information Technology Adoption (ITA) as the focal predictor, and Leadership Commitment (LC) as the moderator. The model, based on a sample size of 372, reveals a statistically significant relationship ($p < 0.0000$) with an R-squared value of 0.2223, indicating that approximately 22.23% of the variance in SCP can be explained by ITA and LC. Examining the coefficients, the constant term is -11.4718 ($p = 0.0008$), suggesting that SCP is negatively impacted when ITA and LC are held constant. For ITA, the coefficient is 2.7615 ($p < 0.0000$), indicating a positive relationship with SCP. This implies that a one-unit increase in ITA is associated with a 2.76-unit increase in SCP, holding LC constant. The key moderator, Leadership Commitment (LC), exhibits a coefficient of 2.9455 ($p < 0.0000$), indicating a positive and significant impact on SCP. This means

that, holding ITA constant, a one-unit increase in LC is associated with a 2.95-unit increase in SCP. The interaction term (Int_1) between ITA and LC is -0.4515 ($p < 0.0000$), signifying the moderating effect of LC on the relationship between ITA and SCP. The test of highest order unconditional interaction reveals a significant R-squared change (0.0380, $p < 0.0000$), indicating that the interaction effect between ITA and LC contributes significantly to the predictive power of the model. Further exploration through conditional effects shows that, at different values of LC (5.5, 5.8333, and 6), the effect of ITA on SCP varies. For instance, at LC = 5.5, the effect is 0.2780 ($p = 0.0006$), suggesting a positive impact. Conversely, at LC = 6, the effect diminishes to 0.0523 ($p = 0.7459$). These findings provide a nuanced understanding of the relationship dynamics. Strong leadership commitment not only independently contributes positively to SCP but also moderates the positive impact of ITA. The specific coefficients and interaction effects quantify the extent of these relationships, offering valuable insights for organizations aiming to strategically leverage IT adoption and leadership commitment to optimize supply chain performance. Papers that further contribute to this discussion include Sambamurthy, Bharadwaj, and Grover (2003) and Melville et al. (2004), emphasizing the pivotal role of leadership commitment in IT adoption and supply chain performance optimization.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1 Introduction

The determination of this study was to examine how leadership commitment impacts the link between IT adoption and supply chain performance. The research was structured into five chapters. The first chapter introduced the research. The second chapter scrutinized and reviewed relevant literature. The third chapter described the methods and procedures exploited to collect data and how the data was examined. The fourth chapter concentrated on the data and the outcomes. The fifth chapter of the study includes a summary of findings, a conclusion, theoretical and managerial implications, and recommendations for further research.

5.2 Recap of study objectives

The principal objective of the research was to investigate information technology adoption and supply chain performance of SMEs in Ghana, with leadership commitment acting as a moderator.

The study specifically aimed to;

1. Identify information technology tools available to enhance SC performance in SMEs.
2. Examine the relationship between information technology adoption and SC performance.
3. Assess the impact of leadership commitment on SC performance.
4. Examine the role of leadership commitment on the relationship between information technology adoption and SC performance.

5.3 Summary of findings

The elaborate bond between information technology (IT) adoption, supply chain (SC) performance, and leadership commitment within commercial organizations was investigated in this study. The study

was carried out by conducting a thorough evaluation of numerous constructs, led by survey results and reliability checks.

The data established that respondents agreed on the favorable impact of IT adoption on SC performance. Respondents agreed that technology such as computers, connectivity to the internet, and smartphones help to improve SC performance. This reveals the increasing significance of modern technology in creating effective supply chain activities.

Additionally, leadership commitment emerged as a vital element. Respondents reported that leadership commitment had a significant impact on the link between IT adoption and SC performance. The study found that effective leadership commitment is an essential facilitator in fostering and enhancing the positive impact of IT adoption on supply chain performance.

The internal consistency of the constructs was shown via reliability assessment. Cronbach's alpha scores suggested adequate to high levels of dependability for supplier relationship management, supply chain uncertainty, and supply chain digitalization. These findings strengthen the trustworthiness of the obtained data and the validity of the conclusion of the study.

Notably, the research looked at people's perspectives on the importance of leadership commitment in achieving good SC performance. While respondents generally agreed on the significance of leadership commitment, the variance in perceptions underscored the complex nature of SC performance, which is impacted by a variety of factors other than leadership.

Finally, this research provides useful insights into the changing landscape of IT adoption, SC performance, and leadership commitment. The findings highlight the transformational power of IT adoption, the critical role of leadership commitment as a facilitator, and the multidimensional character of supply chain performance. Organizations may use these insights to stimulate innovation, refine

leadership techniques, and develop improved supply chain performance in an era of technological growth.

5.4 Managerial and Theoretical Implications

5.4.1 Managerial Implications:

The study emphasized the importance of strong leadership commitment in integrating IT adoption in organizations, leading to improved supply chain performance. It supports existing theoretical frameworks and demonstrates a positive connection between leadership commitment and positive supply chain performance outcomes. These outcomes encompass enhanced cost-effectiveness, streamlined operational processes, and heightened levels of customer satisfaction (Smith et al., 2017; Chen et al., 2020). Effective leadership commitment drives IT adoption, shedding light on how leaders' actions influence IT incorporation and supply chain performance results.

Leadership commitment is crucial for fostering a culture of IT adoption throughout the supply chain. Managers must actively participate in IT initiatives to signal their dedication to innovation and create an environment where IT adoption is perceived as a strategic imperative. This involves investing in leadership development programs that enhance leaders' technological literacy, guide decision-making processes, allocate resources effectively, and communicate the strategic importance of IT adoption to their teams.

Effective leaders must articulate the tangible benefits of IT adoption to all stakeholders, such as enhanced efficiency, reduced lead times, and improved decision-making. Transparency about potential challenges and mitigation strategies builds confidence in the organization's ability to navigate change. Leadership commitment extends beyond the initiation phase of IT adoption, encompassing the ability to manage change and navigate resistance. Managers should invest in developing change management competencies within their leadership teams, equipping them with the skills to address employee

concerns, manage expectations, and maintain momentum throughout the IT adoption journey. Regular assessment enables leaders to identify areas of success, address bottlenecks, and refine strategies, ensuring that organizations maximize the benefits of their IT investments.

By fostering a culture of IT adoption, investing in leadership development, promoting cross-functional collaboration, and embracing change management, organizations can position themselves as agile, tech-savvy leaders in their respective industries.

5.4.2 Theoretical Implications

The study highlighted the complex relationship between IT adoption and supply chain performance, highlighting the transformative potential of IT in redefining traditional supply chain paradigms with the strong influence of leadership commitment. The study's empirical findings showed a positive correlation between IT adoption and key supply chain performance indicators, confirming the Technology Acceptance Model's applicability in predicting IT usage behaviors. In line with established leadership theories, the study underscores that effective leadership commitment drives IT adoption, shedding light on how leaders' actions influence the incorporation of technology and subsequent performance results. This is consistent with Bass and Riggio's (2006) transformational leadership theory, which explains how leaders' unshakable passion and vision may motivate organizational members to adopt breakthrough technology.

Leadership commitment serves as an essential component that accelerates IT adoption projects and influences how effective they are in enhancing supply chain performance. The importance of leadership commitment in fostering IT adoption is echoed by Avolio et al. (2009), who emphasized that leaders' real dedication generates an environment of innovation and adaptation. This intricate web of influence is reminiscent of the leadership cascading process outlined by Yukl (2010), where leadership behaviors resonate through the organizational fabric, imprinting their impact on various facets of functioning.

The research provides a robust framework that resonates with broader academic discourse and offers pragmatic insights for practitioners seeking to enhance their supply chain performance through strategic IT adoption and leadership commitment. By merging insights from leadership, IT, and supply chain domains, this interdisciplinary approach encourages researchers to explore the intricate interplay among these areas, leading to comprehensive theories that provide a fuller understanding. Its theoretical implications contribute to the literature on technology adoption, supply chain performance, and leadership by emphasizing the important role of dedicated leadership in promoting IT adoption initiatives and, eventually, enhancing supply chain results.

5.5 Recommendations for Future Studies

For further studies, a cross-industry analysis will uncover the impact of leadership commitment on IT adoption and supply chain performance across various sectors, providing insights into universal patterns and industry-specific complexities. Longitudinal studies will trace the evolutionary path of IT adoption and its enduring effects on supply chain performance. Factors that moderate the relationship between leadership commitment, IT adoption, and supply chain performance will be explored. Global and cultural disparities will reveal how different contexts shape the influence of leadership commitment on IT adoption and supply chain performance. Investigating diverse leadership styles, technology governance structures, and the consequences of IT adoption and enhanced supply chain performance on customer satisfaction and loyalty will provide comprehensive conclusions. These research pathways will enrich our understanding of the complex interplay between leadership commitment, IT adoption, and supply chain performance, providing valuable insights for shaping organizational strategies.

5.6 Conclusion

There is a need for a culture of commitment within leadership teams, encompassing resource allocation, employee training, and change management. The interdisciplinary approach fosters holistic insights, bridging leadership, IT, and supply chain domains. Leadership commitment is essential for harnessing IT adoption's transformative potential and guiding organizations through the complex interplay of technology and supply chain intricacies, ultimately elevating overall supply chain performance.

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APPENDIX

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI

TOPIC: ASSESSING THE IMPACT OF SUPPLIER RELATIONSHIP MANAGEMENT ON SUPPLY CHAIN UNCERTAINTY: THE MODERATING ROLE OF SUPPLY CHAIN DIGITALIZATION

Introduction

This research is being carried out as part of the academic requirements for the Master of Science in Logistics and Supply Chain Management. This survey tool was designed to help me conduct my research on **"Information Technology adoption and Supply chain performance. The role of leadership commitment".**

The data collected from this questionnaire will be maintained anonymous and held in strict confidence. Only summarized results will be provided to the appropriate entities. Your involvement in this survey is crucial and would be greatly valued for the success of the research.

SECTION A: RESPONDENT'S BIOGRAPHY AND COMPANY PROFILE

When completing this questionnaire, please tick **[√]** in the applicable box or provide an answer as applicable.

1. Your Gender:
   [ ] Male
   [ ] Female

2. Your Age:
   [ ] 23 years and below
   [ ] 24–29 years
   [ ] 30–35 years
   [ ] 36–40 years
   [ ] 41 years and above

3. Your Educational Background:
   [ ] Basic/Primary
   [ ] Secondary
   [ ] Bachelor's Degree
   [ ] Master's Degree
   [ ] Ph.D./Doctorate
4. Please, indicate the department you belong to.
   [ ] Logistics
   [ ] IT
   [ ] Procurement
   [ ] Management
   [ ] Operations

[ ] Finance
[ ] Other

5. Please indicate your position in the firm (e.g., Supply Chain Manager, Operations Manager, etc.).
_____

6. Number of years the firm has been in operation: OBJ
   [ ] Less than 1 year
   [ ] 1-5 years
   [ ] 6-10 years
   [ ] 11-15 years
   [ ] 16-20 years
   [ ] 21 years & above

7. Number of employees in the firm: OBJ
   [ ] Less than 6 employees
   [ ] 6-9 employees
   [ ] 10-29 employees
   [ ] 30-50 employees
   [ ] More than 50 employees

8. Type of ownership: OBJ
   [ ] Fully locally owned
   [ ] Fully foreign owned
   [ ] Jointly Ghanaian & foreign owned

9. Please, indicate the industry your firm belongs to.
   [ ] Logistics
   [ ] Technology
   [ ] Food Processing Industry
   [ ] Manufacturing
   [ ] Finance
   [ ] Procurement
   [ ] Other
10. Firm's annual revenue (in Ghana Cedis).
    [ ] Less than 500,000
    [ ] 500,000 – 1,000,000
    [ ] Above 1,000,000

SECTION B: INFORMATION TECHNOLOGY ADOPTION (Source: Lin & Ho, 2009).

Indicate the extent to which you agree or disagree with each statement by checking the appropriate number from 1 to 7, using the following scale: 1= Strongly disagree 2=Disagree 3= Somewhat disagree 4= Indifferent/Not sure 5= Somewhat agree 6= Agree 7= Strongly agree

Statement	1	2	3	4	5	6	7
11. Computers enhance the SC performance of SMEs							
12. Internet connectivity helps to improve the SC performance of SMEs							
13. Smart phones help to improve the SC performance of SMEs							
14. Information technology adoption is directly linked to SC performance							
15. The adoption of information technology in SMEs has a positive influence on their SC performance							
16. The adoption of information technology in SMEs has a no influence on their SC performance							
17. The supply chain unit of SMEs cannot produce their maximum output without the adoption of information technology							
18. An excellent SC performance is very possible without information technology adoption.							

SECTION C: SUPPLY CHAIN PERFORMANCE (Source: Seril Wijaya, 2020).

Indicate the extent to which you agree or disagree with each statement by checking the appropriate number from 1 to 7, using the following scale: 1= Strongly disagree 2=Disagree 3= Somewhat disagree 4= Indifferent/Not sure 5= Somewhat agree 6= Agree 7= Strongly agree

Statement	1	2	3	4	5	6	7
19. Our use of technologies or practices to optimize storage space has a positive impact on cost reduction							

20. Implementation of strategies or technologies minimizes equipment maintenance and downtime costs							
21. We have established efficient systems to track and meet delivery deadlines							
22. Our organization can quickly alter production capacity to meet changing requirements.							
23. Our communication channels enable swift interaction with customers.							
24. The time required to transition from product development to production is minimal.							

SECTION D: LEADERSHIP COMMITMENT (Source: Chatterjee, Chaudhuri & Vrontis, 2022; Hashemi, Handayanto, Zulfikarijah & Jihadi, 2022).

Indicate the extent to which you agree or disagree with each statement by checking the appropriate number from 1 to 7, using the following scale: 1= Strongly disagree 2=Disagree 3= Somewhat disagree 4= Indifferent/Not sure 5= Somewhat agree 6= Agree 7= Strongly agree

Statement	1	2	3	4	5	6	7
25. Information technology adoption in the supply chain of SMEs is impossible without leadership commitment.							
26. Leadership commitment is the only important variable in ensuring excellent SC performance in business organizations.							
27. SC performance is largely influenced by leadership commitment.							
28. Leadership commitment is the key moderator between information technology adoption and SC performance.							
29. Information technology adoption and SC performance relationship cannot successfully thrive without leadership commitment.							
30. The lack of leadership commitment can negatively affect information technology adoption and SC performance in business organizations.							