INFLUENCE OF E-LOGISTICS ON SUPPLY CHAIN PERFORMANCE OF MANUFACTURING FIRMS, IN UASIN GISHU COUNTY, KENYA. MODERATED BY ELECTRONIC RESOURCE PLANNING

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A THESIS SUBMITTED TO SCHOOL OF BUSINESS, ECONOMICS AND MANAGEMENT SCIENCES, DEPATMENT OF BUSINESS MANAGEMENT IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF BUSINESS MANAGEMENT (PURCHASING AND SUPPLIES)

UNIVERSITY OF ELDORET, KENYA

2025

DECLARATION

Declaration by the Candidate

This thesis is my original work and has not been submitted for any academic award in any institution; and shall not be reproduced in part or full, or in any format without prior written permission from the author and/or University of Eldoret.

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DEDICATION

I would like to dedicate this thesis to my dear parents, Mr. Samwel Ruto and Elizabeth Ruto, for their love, inspiration, and financial support during my thesis journey. I also dedicate it to my dear husband Ian Sang for his patience, encouragement and continuous support that kept me going.

ACKNOWLEDGEMENT

I thank God for the gift of life. My sincere gratitude goes to the University of Eldoret, School of Business, Economics and Management Sciences, and Department of Business Management for their contribution in providing an enabling environment for me to undertake my studies. I am also grateful to my supervisor Dr. Pauline Keitany and Dr. Zachariah Shitote for the guidance provided.

ABSTRACT

Supply chain performance is crucial for businesses to increase efficiency, reduce expenses, and meet changing client needs in a competitive environment. However, manufacturing firms in Kenya face challenges such as competition, high production costs, and untimely product availability. This study aimed to examine the moderating influence of Enterprise Resource Planning (ERP) on the relationship between e-logistics and supply chain performance of manufacturing firms in Uasin Gishu County, Kenya. Specific objectives were to assess the influence of electronic order processing, transportation management, automated warehousing, inventory management, and enterprise resource planning systems on supply chain performance. The study further assessed the moderating influence of enterprise resource planning on the relationship between electronic order processing, transportation management, automated warehousing, inventory management systems, and supply chain performance of these firms. The study was guided by Resource-Based, Innovation, and Transaction Cost Theories. Explanatory research design and a census approach were adopted in collecting data using a closed-ended questionnaire from 270 Heads of 9 Departments closely linked to the study variables in 30 manufacturing firms. Cronbach's alpha and factor analysis were used to assess reliability and construct validity. Data analysis was performed using descriptive and inferential statistics, with a hierarchical regression model used to test all the study hypotheses. Results indicate that firm age (β=0.190, p = 0.021) significantly influences supply chain performance while firm size (β=0.101, p=0.223) does not. These control variables explain 4.8% of the variance in supply chain performance, as shown by an R^2 of 0.048. Findings further revealed that electronic order processing system (β_1=0.316, p=0.001), transportation management system (β_2=0.167, p=0.011), automated warehousing systems (β_3=0.217, p=0.008), and inventory management system (β_4=0.232, p=0.001) significantly influence supply chain performance. These variables explain 56.6% of the variance in supply chain performance (R^2 = 0.566 inclusive of the controls) and 51.8% (ΔR^2 = 518 exclusive of the controls). Results further indicate that ERP (β=0.094, p=0.010), influences supply chain performance. It explains 1.2% of the variation in supply chain performance (ΔR^2 =0.12). Furthermore, ERP was found to moderate the relationship between electronic order processing system (β=0.100, p=0.000), transportation management system (β=0.054, p=0.012), inventory management system (β=-0.120, p=0.002), and does not moderate the link between automated warehousing system and supply chain performance (β=-0.013, p=0.701). The entire Hierarchical model accounts for 64.5% (R^2 = 0.645) of the variance in supply chain performance, much more than the direct effect model, which explains 56.6% (R^2 = 0.566). The study concludes that electronic order processing, transport management, automated warehousing, inventory management systems, and ERP influence supply chain performance. ERP moderates the link between electronic order processing, transport management, inventory management systems, and supply chain performance, but does not moderate automated warehousing systems and supply chain performance. This study contributes to knowledge by examining the interaction of ERP and study variables. Future scholars will benefit from the study's findings as they conduct new research in e-logistics and supply chains in various industries. The policymakers and management may use the results to develop policies and strategies for investing in e-logistics and ERP, as these enhance efficiency in supply chain performance.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS AND ACRONYMS

AI	Artificial Intelligence
AWS	Automated Warehousing System
CFPR	Collaborative Forecasting, And Planning
CRM	Customer Relationship Management
DOI	Diffusion of Innovations
EDI	Electronic Data Interchange
EOPS	Electronic Order Processing Systems
ERP	Enterprise Resource Planning
ICT	Information and Communications Technology
IT	Information Technology
KAM	Kenya Association of Manufacturers
KPIs	Key Performance Indicators
NACOSTI	National Commission for Science, Technology and Innovation
RBT	Resource-Based Theory
SCM	Supply Chain Management
SPSS	Statistical Package for Social Scientists
TAM	Technology Acceptance Model
TCT	Transaction Cost Theory
TMS	Transportation Management System
TOE	Technology-Organization-Environment
UTAUT	Unified Theory of Acceptance and Use of Technology
VIF	Variance Inflation Factor
VRIN	Valuable, Rare, Inimitable and Non-Substitutable

OPERATIONAL DEFINITION OF TERMS

Automated Warehousing System refers to the integration of advanced technologies such as robotics, conveyors, automated storage and retrieval systems (AS/RS), and warehouse management software to enhance the efficiency, accuracy, and speed of warehouse operations, including inventory handling, storage, and order fulfilment (Gu, Goetschalckx, & McGinnis, 2022).

Electronic Order Processing System (EOPS) refers to an integrated digital platform that automates and manages the entire lifecycle of customer orders, ranging from order placement and confirmation to inventory checks, billing, shipping, and real-time delivery tracking, thereby reducing manual errors, accelerating transaction speed, and improving customer satisfaction" (Chong et al., 2020).

E-Logistics is the management of all physical flows (goods) of an organization that sells products through an online platform such as a website or marketplace. It involves setting up specific processes to optimize the management of these flows. It encompasses various activities along the supply chain, including, order processing and management, inventory management, warehousing and storage, transportation and delivery, returns and reverse logistics (Burak, 2022).

Enterprise Resource Planning (ERP) is a business management software system that integrates and manages a company's core business processes and functions, such as accounting, procurement, project management, supply chain operations, and human resources (Katuu, 2020).

Inventory Management System (IMS) is a technology-driven solution that facilitates the real-time tracking, control, and optimization of stock levels, order processing, sales, and deliveries, thereby enhancing inventory accuracy, reducing holding costs, and improving overall supply chain efficiency (Ayochok & Perez, 2024).

Supply Chain Performance refers to the extended supply chain's activities in meeting end-customer requirements, including product availability, on-time delivery, and all necessary inventory and capacity in the supply chain to deliver that performance in a responsive manner (Shahwan, 2024).

Transportation Management System (TMS) is an integrated software platform used to plan, execute, and optimize the physical movement of goods by managing transportation operations, ensuring cost efficiency, real-time tracking, route optimization, and coordination among supply chain stakeholders (Tijan, Jović, Aksentijević, & Žgaljić, 2020)

CHAPTER ONE

INTRODUCTION

1.1 Overview

The chapter covers the study background, problem statement, objectives, research hypotheses, significance, as well as scope of the study. A detailed description of the study's introductory chapter is presented in the sections below.

1.2 Background of the Study

Supply Chain Management (SCM) is vital for businesses globally, as it encompasses logistics management, which includes planning, implementing, and controlling purchasing, warehousing, inventory management, production, transportation, and order fulfillment. In today's competitive landscape, effective supply chain performance is essential for maintaining a competitive edge. Companies must adapt to rapidly changing business conditions, necessitating innovative techniques for flexibility and responsiveness (Attaran, 2020; Benzidia & Makaoui, 2020). The increasing costs associated with supply chains compel businesses to enhance efficiencies, thereby reducing transportation and inventory carrying costs. This focus on cost reduction is critical for global competitiveness, as superior supply chain performance can lead to financial gains and increased productivity (Dissanayake & Pal, 2023; Sarkar et al, 2021).

Globally, manufacturing industries are undergoing rapid digital transformation driven by innovations such as the Internet of Things (IoT), Artificial Intelligence (AI), blockchain, and cloud-based Enterprise Resource Planning (ERP) systems. In advanced economies like Japan and the United States, smart supply chain solutions have improved operational efficiency, customer responsiveness, and real-time

decision-making (OECD, 2021). For instance, Germany's "Industry 4.0" initiative has emphasized automation and e-logistics integration as key enablers of competitive supply chains (Schuh et al., 2020). Similarly, multinational firms have adopted comprehensive ERP systems to streamline operations, improve data visibility, and enhance coordination across global value chains. These systems have become crucial for managing increasing complexity, optimizing transportation and inventory flows, and responding to dynamic market demands (Gu et al, 2022). Despite these advancements, many developing nations still struggle with fragmented logistics and limited digital infrastructure, affecting their supply chain management and performance. Consequently, understanding how ERP systems can enhance the impact of e-logistics functions is essential not only globally but also for emerging economies seeking to improve competitiveness and efficiency.

In Africa, the adoption of advanced technologies like artificial intelligence is transforming supply chain practices. Countries are leveraging AI to enhance visibility, reduce waste, and ensure timely deliveries, addressing the unique challenges posed by the continent's diverse supply chain environments, including agriculture, mining, and manufacturing (Pandey et al., 2024). For instance, Rwandan manufacturing firms have reported significant improvements in performance through cost reduction and effective stock management (Kagwisagye & Mulyungi, 2018).

Moreover, the integration of e-logistics and e-supply chain management practices is becoming increasingly prevalent across African nations, which can lead to improved efficiency and competitiveness in the global market (Fatorachian & Kazemi, 2021). E-logistics, which involves the use of digital technologies such as cloud computing, real-time tracking, and automated warehousing systems, enhances visibility, reduces

lead times, and supports agile responses to market demands. These technologies enable businesses to streamline inventory management, improve order fulfillment accuracy, and optimize transportation and delivery routes. As African economies continue to digitize their logistics infrastructures, the adoption of e-logistics solutions is playing a critical role in reducing operational costs and enabling firms to integrate more effectively into regional and global value chains (Abualigah et al., 2023).

Focusing on Kenya, the manufacturing sector is crucial, contributing significantly to the GDP and employment. The sector is expected to grow from 7.2% of GDP in 2022 to 20% by 2030, driven by strategic initiatives aimed at enhancing manufacturing capabilities (Jepchumba, 2023). However, the performance of manufacturing firms in Uasin Gishu County, which has 30 registered firms, remains suboptimal due to inadequate automation in their supply chain and logistics processes (Odhiambo et al., 2017). Efficient inventory management is highlighted as a key factor for successful supply chain performance in Kenya, where businesses strive to balance stock levels to meet customer demands without incurring unnecessary costs (Nyongesa, 2018). The importance of Enterprise Resource Planning (ERP) systems is also underscored, as they facilitate improved communication and operational efficiency within supply chains (Molina-Castillo et al., 2022; Ruivo et al., 2020).

Enterprise Resource Planning (ERP) is used in this study as a moderator based on the suggestion of Molina-Castillo *et al,* (2022), who did a comparative study between SME's with ERP systems and without ERP technologies in place. These authors Molina-Castillo et al., 2022) found some contradictory results: their business model research had a direct positive influence on business performance for enterprises that did not install an ERP, whereas downstream innovation led to greater value captured

through increased efficiency and cost savings. Their study recommended for further investigations to be undertaken in different countries and contexts using ERP in larger enterprises. This is further emphasized by Schlichter, Klyver, and Haug (2021) about the importance of research on ERP systems in businesses, as technological advancements present new opportunities and challenges. Uasin Gishu County has 30 registered manufacturing firms (see Appendix V), which are also not performing well. The poor performance of these enterprises in Uasin Gishu is largely due to their failure to fully automate their supply chain and logistics processes (Odhiambo *et al.*, 2017). Due to these challenges and the sector's contribution to the nation's GDP and employment, conducting research in this area is critical.

1.3 Statement of the Problem

In an ideal scenario, the performance of supply chains aims to enhance efficiency, reduce costs, and adapt to the evolving demands of clients in a competitive landscape. Companies that excel in supply chain performance gain advantages such as increased market share, reduced expenses, and greater value for shareholders. As noted by Negi (2023), the intensifying competition across various sectors has driven businesses to refine their operational processes and form new partnerships, leading to lower business costs. These collaborations have introduced innovative management strategies, including e-logistics, which contributes between 10% to 15% of a nation's GDP (Buyko, 2022). Furthermore, e-logistics can potentially decrease a company's costs by 16% to 20% (Nguyen & Ho, 2023).

Despite the crucial role of manufacturing firms in job creation, economic growth, and addressing social and environmental challenges (Endris & Kassegn, 2022), this sector faces significant challenges in maintaining business sustainability and operational

efficiency. Factors such as heightened competition, shifting customer preferences, high production costs, and delays in product availability are contributing to this turmoil (Murugi, 2022; Musalagani, 2023). Additionally, poor supply chain management is evident through issues like extended material lead times, unreliable buyer-supplier relationships, and elevated supplier costs (Kanike, 2023; Odhiambo et al., 2017).

Although logistics management plays a critical role in ensuring operational efficiency and competitive advantage for manufacturing firms, a majority of Kenyan manufacturers, over 90% continue to rely on manual logistics systems (Jepherson et al., 2021; Murugi, 2022). This high prevalence of manual processes suggests persistent inefficiencies, including delays, poor customer service, and fragmented supply chain communication. While global and regional studies have highlighted the transformative potential of **e-**logistics and Enterprise Resource Planning (ERP) systems in improving productivity, integration, and responsiveness across supply chains (Georgise et al., 2020), these findings are largely based on developed or more industrialized emerging economies. Consequently, there is a notable scarcity of empirical research examining how these digital technologies influence supply chain effectiveness in under-researched local contexts such as Uasin Gishu County in Kenya. This gap is critical, as regional and contextual factors such as infrastructure, digital literacy, organizational culture, and policy environment can significantly affect the adoption and impact of digital logistics solutions. Thus, existing studies offer limited generalizability to Kenyan manufacturing settings, particularly in counties outside major urban centers.

To bridge this gap, the present study aims to investigate the effect of e-logistics and ERP systems on supply chain effectiveness within manufacturing firms in Uasin Gishu County, Kenya. By focusing on this specific region, the study provides context-sensitive insights that can inform localized strategies for logistics digitization and broader supply chain optimization.

1.4 Study Objectives

The following are the study objectives.

1.4.1 General Objective of the Study

To examine the moderating influence of Electronic Resource Planning on the relationship between E-logistics and Supply Chain Performance of manufacturing firms, in Uasin Gishu County, Kenya

1.4.2 Specific Objectives of the Study

i. To assess the influence of the electronic order processing system on the supply chain performance of manufacturing firms in Uasin Gishu County, Kenya.
ii. To establish the influence of the transportation management system on the supply chain performance of manufacturing firms in Uasin Gishu County, Kenya
iii. To determine the influence of automated warehousing systems on the supply chain performance of manufacturing firms in Uasin Gishu County, Kenya
iv. To examine the influence of the inventory management system on the supply chain performance of manufacturing firms in Uasin Gishu County, Kenya
v. To determine the influence of enterprise resource planning on the supply chain performance of manufacturing firms in Uasin Gishu County, Kenya

vi. To evaluate the moderating influence of enterprise resource planning on the relationship between:

a) Electronic order processing system and supply chain performance of manufacturing firms in Uasin Gishu County, Kenya
b) Transportation management system and performance of manufacturing firms in Uasin Gishu County, Kenya
c) Automated warehousing system and performance of manufacturing firms in Uasin Gishu County, Kenya
d) Inventory management system and performance of manufacturing firms in Uasin Gishu County, Kenya

1.5 Research Hypotheses

To achieve the above objectives, the following hypothesis is to be tested

H_{01}: Electronic order processing system has no significant influence on supply chain performance of manufacturing firms in Uasin Gishu County.

H_{02}: Transport management system has no significant influence on supply chain performance of manufacturing firms in Uasin Gishu County.

H_{03}: Automated warehouse system has no significant influence on supply chain performance of manufacturing firms in Uasin Gishu County.

H_{04}: Inventory management system has no significant influence on supply chain performance of manufacturing firms in Uasin Gishu County.

H_{05}: Enterprise Resource Planning has no moderating influence on supply chain performance of manufacturing firms in Uasin Gishu County.

H_{06}: Enterprise Resource Planning has no moderating influence on the relationship between:

a) Electronic order processing system and supply chain performance of manufacturing firms in Uasin Gishu County
b) Transportation management system and supply chain performance of manufacturing firms in Uasin Gishu County
c) Automated warehousing system and supply chain performance of manufacturing firms in Uasin Gishu County.
d) Inventory management system and supply chain performance of manufacturing firms in Uasin Gishu County.

1.6 Significance of the Study

This study will be of importance to different partners in manufacturing firms. It will help the administration as it will lay out the connection between supply chain performance and e-logistics adoption by manufacturing firms in Kenya. It will assist executives in identifying areas within the supply chain that will require improvement for higher net revenues. The supply chain is a rapidly developing field, and the findings of this study will go a long way in enlightening supply chain specialists on areas that will require their attention, particularly at their workplaces, since the manufacturing sector plays a significant role in revenue generation for Kenya.

In addition, the findings of this study will help policymakers and management in developing relevant policies and strategies that will strengthen e-logistics, electronic resource planning adoption, and supply chain performance. Finally, academicians will benefit from the findings, theories, and models used in this study for future research.

1.7 Scope of the Study

The main purpose of this study was to examine the moderating influence of enterprise resource planning on the relationship between e-logistics and supply chain performance of manufacturing firms in Uasin Gishu County, located in the Rift Valley region of Kenya, with Eldoret as its administrative and commercial hub. The county is a key economic zone known for its vibrant manufacturing sector, agro-processing industries, and strategic position as a gateway to western Kenya and neighboring countries. Its well-developed infrastructure, access to transportation networks, and presence of major manufacturing firms made it an ideal location for studying the integration of e-logistics and ERP systems. The main variables of the study are electronic order processing, transportation management system, automated warehousing system, inventory management system, enterprise resource planning, and supply chain performance. The study was guided by Resource-Based Theory and Innovation Diffusion Theory, and data were collected from 270 Heads of Departments using a self-administered closed-ended questionnaire. The study was conducted between the months of June to August 2024.

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview

This section describes the literature review of the studies done on the influence of e-logistics, enterprise resource planning, and supply chain performance of manufacturing firms. The concepts of dependent and independent variables were highlighted in this chapter, a summary of the literature, the theories that relate to it, stating the gaps therein, and how they were filled.

2.2 Theoretical Review

The theoretical framework for this study is grounded in three key theories: Resource-Based Theory, Innovation Theory, and Transaction Cost Theory. Resource-Based Theory emphasizes the role of valuable and unique resources, such as e-logistics and ERP systems, in achieving competitive advantage and improved supply chain performance. Innovation Theory highlights the importance of adopting new technologies, like e-logistics, to enhance operational efficiency and drive innovation in supply chain management. Transaction Cost Theory focuses on reducing the costs associated with managing transactions within the supply chain, suggesting that e-logistics, facilitated by ERP systems, can lower transaction costs and optimize supply chain processes. Together, these theories provide a comprehensive foundation for understanding the impact of e-logistics adoption and ERP on supply chain performance in manufacturing firms. The major theory guiding this study is Resource-Based Theory (RBT). RBT posits that organizations gain a competitive advantage through the effective acquisition, management, and utilization of valuable, unique, and inimitable resources. In the context of this study, e-logistics and ERP systems are

viewed as strategic resources that can enhance supply chain performance in manufacturing firms by optimizing logistics processes and improving resource management, thereby contributing to greater efficiency and profitability

2.2.1 Resourced-Based Theory

Resource-Based Theory was first invented by Birger in the year 1984 (Barney, 2021). Resource-Based Theory (RBT) emerged in strategic management literature in the 1980s and gained prominence as a framework for understanding competitive advantage. Developed by scholars such as Barney et al. (1991), RBT posits that a firm's competitive advantage stems from its unique bundle of resources and capabilities (Uyanik, 2023). These resources can be tangible or intangible (for instance, intellectual property), and capabilities refer to the firm's ability to deploy and leverage these resources effectively.

This theory relates with the current study RBT provides a lens through which to analyze how different organizational resources, including technology and managerial capabilities, contribute to supply chain performance (Chatterjee et al., 2024). The application of the Resource-Based Theory (RBT) in guiding e-logistics, enterprise resource planning, and supply chain performance of manufacturing firms involves leveraging specific sets of resources that are bundled into valuable, scarce, and hard-to-imitate capabilities. The RBT emphasizes the importance of internal resources and capabilities over external opportunities, focusing on how these internal assets can create sustainable competitive advantages for firms. In the context of e-logistics, which includes electronic order processing systems, transportation management systems, automated warehousing systems, and inventory management systems, the

RBT can help firms understand how to utilize their resources effectively to enhance operational efficiency and performance (Chae et al., 2020).

The proposed RBT can help manufacturing firms in the efficient implementation of e-logistics since it aims to achieve optimal resource utilization with reference to communication technologies in systems such as IT (Kakhki & Sajadi, 2024). When IT is integrated within the supply chain process, the resulting supply chain capabilities represent superior order-specific assets to the firm and are very difficult for competitors to imitate. This strategy corresponds with the Other Orientation that is embodied in the RBT in terms of the continual development and maintenance of competitive advantage, given that valuable and unique resources are deployed.

Also, the RBT can be used to contribute positively towards developing ERP systems in manufacturing companies (Nawaiseh et al., 2022). When the rationale for the selection of ERP systems is linked to value-driven tangible and intangible resources of the firm, companies are capable of achieving efficiency in operations, effectiveness in decisions, and supply chain outcomes. Thus, the RBT lesson for firms is that internal capabilities provide leverage for achieving competitive advantage; firms can apply it to the optimization of their ERP resources, data, and processes.

2.2.2 Innovation Theory

Innovation Theory was developed by Joseph Schumpeter in 1911 (Jiříček & Dostálová, 2020). Schumpeter rightly postulated that new product development is the main force behind economic growth and competitive forces in industries (Kaufmann, 2022). Product innovation was noted as the ability to offer a new product or service, process innovation was labelled as the capability to enhance processes, and

organizational innovation was described as the ability to reorganise processes in an organisation (Vlados, 2019).

When it comes to the supply chain performance, to examine how firms in Uasin Gishu County utilize technology advancements in logistics and supply chain in the superiority, cost-slash efficiency, and market distinctiveness, Innovation Theory will be employed. By understanding the main concepts of Innovation Theory, one can see that electronic order processing and automated warehousing opening inventory management systems as a form of new practice that has a potential to create a forced transformation on the organization and improve its competitive position (Amini & Jahanbakhsh Javid, 2023).

The theory is mostly centered around effective innovations but the fact that innovative activities are associated with high failure rates is nowhere captured and how one can avoid or at least deal with them is not explained. There is a light on Innovation Theory that suggests that innovation means the destruction of existing markets and business models by new technologies and methods (Jackson, 2020). Entrepreneurship behavior concepts contained in Innovation Theory are so postured to make firms search for opportunities and exploit them and this is where innovation is fostered fully.

2.2.3 Transaction Cost Theory

Transaction Cost Theory (TCT) was formulated by honorary professor of economics, Ronald Coase, in 1937 (Afrifa, 2021). TCT endeavors to cover why firms exist and how they decide on the use of markets or internal coordination for organising economic transactions. It thereby posits that search, negotiation, and monitoring costs

determine the choice of governance structure. This is related to the current study in the sense that Transaction Cost Theory can explain the activities of manufacturing firms when deciding on the use of logistics and supply chain management systems (Schmidt & Wagner, 2019). TCT can assist in finding why firms choose particular supply chain approaches (outsourcing logistics services) and hence, supply chain effectiveness: examining transaction costs of market and related transactions (salary, losses). For instance, there may be great emphasis on acquiring Transportation Management Systems to minimize the cost of transacting in outsourcing of transport services and enhance supervision of logistics operations.

TCT operationalizes decision makers as store managers or retail owners who have bounded rationality powers of cognition and a very small information processing capacity, and as such, they make acceptable decisions rather than the best (Cuypers et al., 2021). TCT assumes that people are egoistic and selfish and regulate their behavior so as to achieve the maximum outcome for themselves. This assumption affects decision-making with regard to governance structures to counteract opportunism (Jarke-Neuert & Lohse, 2022).

2.3 Concept of Supply Chain Performance

Supply Chain Performance (SCP) can be defined as manufacturing firms' ability in terms of efficiency and impact in the management of all supply chain functions (Yumurtacı Hüseyinoğlu et al., 2020). In detail, Kazmi and Ahmed (2022) provide a definition of SCP, which involves a wide array of tasks regarded as critical to the effective running of supply chains. Some of the strategic management activities include: procurement of the inputs, supply chain management exercises that involve

planning, acquiring, and transferring materials, resources, and finished products in the least value time.

SCM looks at how a supply chain meets the needs of consumers, flow and control of costs and management of resources in achieving the chain's goals (Kamble & Gunasekaran, 2020). This definition supports SCP as a broader all-encompassing proposition rather than solely the ability to deliver on key objectives, manage costs, and allocate resources throughout the supply chain (Gupta & Ramachandran, 2021). The SCP tactical model holds it that these objectives, as a form of effective SCP, imply that various processes are enhanced to deliver products well on time at the lowest possible cost and with the highest possible quality and quality satisfaction on the part of consumers.

Strategic management perspective involves the ability of a firm to position its supply chain accordingly to the business strategies in order to increase its overall profit (Tripathi & Roy, 2023). This view underscores the importance of supply chain as a strategic boundary element, implying that mastery of supply chain processes is fundamental in a firm's competitive plan since all supply chain activities must be strictly in alignment with corporate goals and objectives (Dhaigude et al., 2021). In this way, the supply chain is managed in a way that guarantees maximum efficiency of operational capabilities and direct supply of these capabilities in support of the strategic objectives of the business.

Logistics perspective relates with the effectiveness of logistics activities for instance transport, storage and inventory which determines customer satisfaction (Umair, Zhang et al., 2019). This viewpoint emphasizes the logically structural approach of

determining the supply chain total performance as a function of efficiency of the resources and effectiveness of the services. Measuring supply chain performance is mainly done through monetary indicators associated with supply chain activities including the costs savings and the returns on investment (Lee et al., 2022). This approach underscores the importance of translating supply chain efficiencies into tangible financial metrics that can significantly impact a firm's bottom line. Financial indicators such as cost reductions, return on investment, and overall profitability are crucial for assessing the efficacy of supply chain management and for making informed strategic decisions.

Sustainability perspective focuses on how environmentally and socially sustainable practices are integrated within the supply chain, measuring performance not just in economic terms but also in environmental and social impact (Miemczyk & Luzzini, 2019). This approach emphasizes the integration of environmentally and socially sustainable practices within the supply chain, assessing performance not only in terms of economic gains but also considering environmental and social impacts. This perspective reflects a growing recognition that sustainable practices are crucial for long-term business success and corporate responsibility.

Supply chain performance measures how well a supply chain delivers products to customers, balances costs, and utilizes resources effectively. This definition is appropriate as it encapsulates the operational efficiencies critical to the success of manufacturing firms in Uasin Gishu County, focusing on the core aspects of SCP that directly affect customer satisfaction and resource management. The effectiveness of SCP was measured using the following key performance indicators (KPIs): Delivery

Performance: Measures the on-time delivery rates of products to customers, which is crucial for maintaining customer trust and satisfaction (Elgazzar et al.,2019).

Inventory Turnover: This KPI assesses how quickly inventory is sold and replaced over a period, indicating the efficiency of inventory management (Tadayonrad & Ndiaye, 2023). These metrics were chosen because they provide a comprehensive evaluation of supply chain operations, focusing on efficiency, cost management, customer satisfaction, and responsiveness all crucial for sustaining competitive advantages for manufacturing firms.

2.4 Concept of E-Logistics

E-Logistics is the use of information technology to manage and optimize logistics processes in online businesses. It encompasses various systems and technologies to efficiently handle the flow of goods from origin to destination, including electronic order processing system, transportation management system, automated warehousing system and inventory management system. Electronic Order Processing System (EOPS) is a software system that is meant to make orders executable in the most effective way, in regard to stock status, and in addition to avoiding mistakes such as manual data entry ones (Ahn et al., 2022). Types of EOPS include electronic order processing system where orders are done through paperwork with human interface from one stage to the other thus can be erroneous. Some of the areas of operations EOPS perspective comprises Order Placement where customers order goods through; Features recorded include customer data, payment, and delivery information (Wickens & Carswell, 2021). Inventory Management perspective: EOPS offer an instant view of stocks, thus assisting businesses avoid agliostocks or stock deficits (Panigrahi, et al., 2022).

Order Fulfillment perspective: This includes such activities as storing and selecting products to be shipped. High effectiveness of fulfillment processes is important to retain customers (Heuwinkel, 2022). Shipping and Delivery Tracking perspective: EOPS worked with shipping carriers to determine the cost and obtain tracking data to enhance the customer's experience (Ermagun & Stathopoulos, 2021). Returns Management perspective: It is very important to manage returned products properly to avoid stressing the customers of your company. This way EOPS can be useful and efficient where it involves dealing with refunds or exchange of products. Reverse logistics methods that involved linking sales order software to automate order processing, minimize paperwork, and hasten orders fulfilment (Martinez et al., 2019). Electronic order processing that results in the integration of various order phases in one program for better flow and satisfaction of consumers.

Electronic Order Processing System (EOPS) serves as a comprehensive software solution meticulously crafted to streamline order execution processes, ensuring not only the efficient fulfillment of orders but also the maintenance of optimal stock levels while mitigating the risk of manual data entry errors (Ahn *et al,* 2022). This system encompasses the end-to-end processing of customer orders, extending from order placement to fulfillment, while concurrently offering real-time order tracking and integration with broader supply chain management activities. An electronic order processing system uses digital networks to process customer orders, communicate with inventory databases, and interface with shipping systems to fulfill orders (Giannakis et al., 2019). As outlined by Giannakis *et al.* (2019), this system leverages digital networks to process customer orders, communicate seamlessly with inventory

databases, and interface with shipping systems to facilitate the efficient and accurate fulfillment of orders.

Electronic order processing system enhances the order processing phase, by integrating greater application of algorithms and data analysis procedures with the aim of predicting the time taken to process orders and thus services (Oliveira & Handfield, 2019). Being able to analyse the times taken to process orders helps the system to predict these times with much precision necessary in efficient resource management and streamlining of business operations. In addition, EOPS improves the accuracy of the predicted demand and other operational factors using machine learning once the initial forecasts are made and applied to operations with the goal of achieving higher levels of accuracy with the goal of making better future predictions.

An EOPS controls all periods of Internet purchasing, payment, updating stock, and informing customers of order status (Zacker, 2023). Specifically, considering an e-commerce business, an EOPS controls such activities connected with order processing as payment, order status notifications, and updating of inventories. For the purpose of this study, the definition from the Supply Chain Management Perspective is selected: This system includes all the procedures of order management of the chain management customer's orders with real-time capabilities to track orders, as well as the integration with other supply activities. This definition is chosen because it captures the interaction of EOPS with other supply chain activities that are very important in assessing its effect on the supply chain performance of manufacturing firms in Uasin Gishu County. I think it increasingly embodies the holistic function of EOPS in delivering oversight and effectiveness in supply chain management, stating goals similar to our study's purpose (Obunde, 2019).

The metric used to measure the results of EOPS plans in this regard included several KPIs of its functioning. Order Cycle Time: This quantifies the whole duration of order preparation to delivery. A decrease in cycle time, as a rule, pointed to the improvement of the EOPS effectiveness. Order Accuracy: This measures the process through which orders formed are accurately fulfilled. When accuracy of the particular amounts is high, that can testify to successful implementation as well as performance of the EOPS (Bertiger et al., 2020). These metrics are used because they afford an overall picture of the workings of the system concerning factors that are of significant importance in the performance of manufacturing firms such as the satisfaction of the customer and cost control.

A Transportation Management System (TMS) is a critical component of supply chain management dedicated to the planning, execution, and optimization of the transport of goods (Dorofeev et al.,2020). Technology and Systems Perspective: A TMS is designed to incorporate software to enable the real-time management of transportation operations, routing, and automated choice of the carrier (Fagerberg & Ungerth, 2023). Logistics and Operations Perspective: This system oversees all transportation activities and provides the required visibility for the effective flow of material throughout the logistics network (Ivanov et al., 2021). Strategic Business Perspective: A TMS is not merely a logistics tool but a value-creating tool that integrates transportation with overall organizational goals to improve customer satisfaction and profitability (Kulakov, 2023).

Sustainability Perspective: She notes that the system also considers methods that will lower logistical impact on the environment via selection of better routes and optimal

loading capacities that in turn will enhance environmentally sound logistical practices in the business (Egert & Repo Wecklauf, 2023).

Customer Service Perspective: From the customer service perspective, a TMS effectively controls the time and precise tracking of shipments, which affects customer satisfaction (Mehmood, 2021). For this study, the definition from the Logistics and Operations Perspective is selected: This system manages all the transportation processes, integrates the supply chain, and offers visibility to the logistics chain. This definition embraces the efficiency of activities in the transportation network by providing efficient and transparent solutions through a TMS. To assess the effectiveness of a TMS, the following key performance indicators (KPIs) were utilized: This cost indicates the cost of transporting one unit of the product to determine the efficiency of the transportation process (Marinagi et al., 2023).

Freight Bill Accuracy: Supervises variances in billing, which are signs of problems with freight rating and auditing in the TMS. These are chosen as these metrics correlate directly with the operational success of TMS in cost management, accuracy in delivery, timeliness of processes and the overall effectiveness of partnerships. Automated Warehousing System (AWS) is defined as the use of technology in carrying out warehouse tasks like storage, order picking, sorting, and packing services, with little or no human interaction (Hao et al., 2020).

Technological Perspective: Automated Warehousing System is a system that utilizes robots and computers to handle store and transport products in a depot with the least dependence on human skilled labor, improved accuracy (Custodio & Machado, 2020).

Logistics Management Perspective: Warehouse operations are made efficient by AWS since most of them are time-consuming, repetitive, and demand manual efforts, and most often involve significant mistakes; this improves throughput and lowers operational costs (Tran-Dang et al., 2023). Business Efficiency Perspective: It is evidently the valuable system for space management, efficiency of resources and the substantial decrease of the time needed for processing; in general, it affects business productivity (Niaz, 2022).

Safety and Ergonomics Perspective: Automated warehousing systems enhance safety and health at workplaces since some tasks that would otherwise require human intervention are eliminated; thus, requiring less effort from employees (Gruchmann et al, 2021). Sustainability Perspective: AWS not only improves operational productivity but also helps to address the ecological issue because the company decreases energy consumption and the negative impact of a warehouse industry on the natural environment. The definition selected for this study is from the Logistics Management Perspective: Some of these tasks include picking, packing, labeling, and sorting, which are mostly manual and repetitive, hence causing numerous problems to warehousing companies AWS helps in streamlining these processes, thus improving throughput and reducing overhead costs. The reason for choosing this definition is that it covers key utilities of AWS in the most concise manner, pointing to its efficiency increase and cost saving (Winkelhaus & Grosse, 2020).

To measure the effectiveness of an AWS, the following key performance indicators (KPIs) were considered: Inventory accuracy. It compares the details recorded on the warehouse inventory against actual inventory and determines the efficiency of the AWS in providing accurate records. Order Fulfillment Speed: Evaluates the time

elapsed between one's order receipt and product shipment, a more direct concomitant of automated warehouses (Tadayonrad & Ndiaye, 2023). The results above summarize AWS performance in terms of accuracy, speed, cost, and environmental impact. What is more, they are valuable for learning about the potential of automated systems to turn conventional warehousing into a key supply chain element.

Inventory management system commonly referred to as IMS is a process of monitoring the stock quantity, position and condition of the inventories across the supply chain (El Jaouhari et al., 2022). Operational Efficiency Perspective: An IMS optimizes inventory management, so products are in the right place at the right time thus cuts costs attributable to overstocking or being out of stock (Kirimi, 2023). Financial Management Perspective: This system determines the economic ordering quantity coupled with the safety stock, which in one way or the other affects a firm's financial capacity a due to the capital locked up in inventory (Chebet & Kitheka, 2019).

Customer Satisfaction Perspective: IMS guarantees the satisfaction of customer demand in order to improve customer loyalty, which is important to the company (Teoh et al., 2023). Risk Management Perspective: They decrease elements related to inappropriate inventory since they present enough and timely information (Twum & Peprah, 2020). Sustainability Perspective: An IMS helps in sustaining the organization by reducing wastage as well as, therefore, the carbon footprint of its supply chains (Ghosh et al., 2020). An IMS organizes the effective control of stocks to ensure that essential stocks are stored in right inventories at the correct time and, hence, avoiding extra expenses like overstocking or running out of stock Mishra et al., (2020) Logistics and Operations Perspective: This system controls all the transport

operations and gives the visibility on transported products across the whole logistic chain (Ivanov et al., 2021). Strategic Business Perspective: A TMS is not a simple technical platform addressing only logistic optimization problems but a competitive advantage that synchronizes transportation with company's strategic objectives to optimize customer satisfaction and revenue (Kulakov, 2023).

Sustainability Perspective: The system also addresses concerns of environmental sustainability throughout route choices and optimized load capacities, hence promoting environmentally sustainable logistics operations (Egert & Repo Wecklauf, 2023). Customer Service Perspective: From the customer service perspective, a TMS guarantees shipment deliveries and tracking information that affects customers' satisfaction (Mehmood, 2021). For this study, the definition from the Logistics and Operations Perspective is selected: This system supervises all transport operations and offers visibility across the logistics chain while supporting the flow of products and solutions. This definition captures the essential dynamic flow processes of a TMS and stresses on providing transparency to the varied transportation channels.

To assess the effectiveness of a TMS, the following key performance indicators (KPIs) was utilized: Transportation Cost per unit: Transportation is one of the key activities alongside manufacturing in any organization, and therefore its cost is measured per unit of product with a view of determining the efficiency of the transport activity. Freight Bill Accuracy: Implements the identification of variance in billing, which represents an overall problem in freight rating and auditing done in the TMS. These metrics have been selected as they reflect first-line measures of TMS's performance in terms of cost, efficiency, accuracy and effectiveness in working with its partners.

Automated Warehousing System (AWS) can be defined as the application of technology to handle, store, sort and pack products in a warehouse without much human interaction (Hao et al., 2020). Technological Perspective: An AWS is an advanced system for the storage and handling of products using robotics and software in a warehouse while limiting the amount of physical work done (Custodio & Machado, 2020). Logistics Management Perspective: AWS helps optimize warehouse logistics since most of the tasks implemented are highly laborious and erroneous, which ultimately increases throughput and lowers operational costs (Tran, 2023). Business Efficiency Perspective: This system is a directed tool that helps to minimize the amount of space needed, minimize waste, and greatly shorten the time required for processing some tasks, which contributes to the preservation of the overall efficiency of a business enterprise (Niaz, 2022).

Safety and Ergonomics Perspective: Systems for automating warehousing relieve human employees of physically burdensome tasks, enhancing workplace safety and comfort (Gruchmann et al., 2021). Sustainability Perspective: Included in these benefits is the optimization of the operations of the warehouses through the reduction of power consumption and the subsequent decrease of the ecological impact on the environment by the warehouse (Finco et al., 2023). The definition selected for this study is from the Logistics Management Perspective: AWS makes warehouse coordination, control, and flow less dependent on manpower and more efficient, thus cutting operating costs. This definition was chosen because, by stating the main processes for which AWS is used, it highlights the main idea of AWS to be focused on enhancing operational effectiveness and avoiding expenses (Winkelhaus & Grosse, 2020). To measure the effectiveness of an AWS, the following key performance

indicators (KPIs) were considered: Inventory Accuracy: Measures the precision of inventory records against actual stock, highlighting the effectiveness of the AWS in maintaining accurate data.

Order Fulfillment Speed: Assesses the time taken from receiving an order to its shipment, which is a direct outcome of warehouse automation efficiencies (Tadayonrad & Ndiaye, 2023). These metrics provide a comprehensive assessment of AWS performance, covering accuracy, efficiency, cost-effectiveness, and sustainability. They are critical for understanding how automated systems can transform traditional warehousing into a strategic asset within the supply chain.

An Inventory Management System (IMS) is a tool used to track and manage the quantity, location, and status of goods throughout the supply chain (El Jaouhari et al., 2022). Operational Efficiency Perspective: An IMS streamlines inventory control, ensuring that the right products are in the right place at the right time, minimizing costs associated with overstocking and stockouts (Kirimi, 2023). Financial Management Perspective: This system optimizes the economic ordering quantity and safety stock levels, directly impacting a firm's financial health by reducing unnecessary capital in inventory (Chebet & Kitheka, 2019).

Customer Satisfaction Perspective: IMS ensures that customer demand is met promptly and accurately, thereby enhancing customer satisfaction and loyalty (Teoh et al., 2023). Risk Management Perspective: It mitigates risks associated with inventory mismanagement, such as obsolescence, theft, and spoilage, by providing accurate and timely data (Twum & Peprah, 2020). Sustainability Perspective: An

inventory management system contributes to sustainability by reducing waste and optimizing the supply chain's carbon footprint (Ghosh, Jha & Sharma, 2020).

The definition chosen for this study is from the Operational Efficiency Perspective: An IMS streamlines inventory control, ensuring that the right products are in the right place at the right time, minimizing costs associated with overstocking and stockouts (Mishra et al., 2021). This definition is useful, especially with the focus placed on the operational aspects of an IMS, namely the efficiency and cost-effective resource that is expected to form the basis for manufacturing firms in Uasin Gishu County.

The effectiveness of an IMS can be assessed using the following key performance indicators (KPIs): Inventory Turnover Ratio: The ability to measure how often inventory is sold and replaced over a period, indicating the efficiency of inventory management in regard to the activity level of sales. Stockout Frequency: Records the number of cases where inventory is out of stock when a customer demands it; a perfect sign of IMS efficiency (Prakash et al., 2018). These metrics provide the IMS with a wide-ranging picture of efficiency, costs, precision, and financial sustainability. This ensures that the results obtained from the inventory management system are justified in relation to the general efficiency and customer needs and expectations in the supply chain.

2.5 Concept of Enterprise Resource Planning (ERP)

Enterprise Resource Planning (ERP) is an integrated management system that consolidates all the core processes needed to run a company into one comprehensive system (Kirmizi & Kocaoglu, 2022). Business Integration Perspective: ERP systems integrate all facets of an enterprise into a single, coherent information system that

operates in real time, without relying on periodic updates (Caserio & Trucco, 2018). An ERP system enhances efficiency through the automation of daily tasks and the simplification of complex processes, leading to streamlined operations and reduced operational costs (Di Camillo, 2023). Strategic Decision-Making Perspective: ERP systems provide critical insights and analytics that support strategic decision-making by aligning data across all departments (Shi & Wang, 2018).

These systems help manage risk and compliance by standardizing business processes and keeping an audit trail of all transactions (Devarajan, 2018). Customer Relationship Management Perspective: ERP extends its functionality to manage customer relationships by integrating customer data across sales, support, and marketing (Buttle & Maklan, 2019). ERP systems integrate all facets of an enterprise into a single, coherent information system that operates in real time, without relying on periodic updates (Junior et al., 2019).). This definition is selected because it emphasizes the holistic integration capability of ERP systems, which is crucial for manufacturing firms in Uasin Gishu County looking to synchronize various business functions into a unified framework.

The performance of an ERP system can be evaluated using these key performance indicators (KPIs): Process Cycle Time: Measures the time required to complete business processes from start to finish, indicating the efficiency gains from using the ERP system (Chopra et al., 2022).). Cost Savings: Assesses the reduction in operational costs as a result of deploying an ERP system, reflecting its economic impact. These metrics provide a holistic view of the ERP system’s performance, covering efficiency, cost-effectiveness, usability, data integrity, and adaptability.

They are essential for assessing how well the ERP supports the overall strategic objectives of the organization.

2.6 Empirical Literature Review

This subsection reviewed literature related to electronic order processing systems, transportation management systems, automated warehousing systems, inventory management systems, and enterprise resource planning.

2.6.1 Electronic Order Processing Systems and Supply Chain Performance

Several studies have been done in different contexts on how electronic order processing systems influence supply chain performance (Oteki et al,2018). The effect of Electronic Order Processing on supply chain performance in the energy sector in Kenya was explored to assess how it influences the efficiency and effectiveness of operations (John, 2018). The study applied a research design where both qualitative and quantitative techniques were used. The study aimed to collate and collect information from the respondents. The study employed a stratified random sampling technique in coming up with a sample size of 152 respondents from a total of 246 target population in the energy sector. All the variables, that is, electronic data interchange, e-tendering, and supply chain integration, were found to influence effective supply chain management processes in the energy sector. However, this study dwelt on the energy sector, which creates a gap that needs to be filled, as the current study is on the manufacturing firms and not the energy sector, hence a literature gap.

Electronic Order Processing Systems (EOPS) have been shown to significantly enhance the efficiency and effectiveness of supply chains in the manufacturing sector.

In Bangladesh, Saleheen and Habib (2023) examined the impact of Electronic Order Processing Systems (EOPS) on supply chain performance in the manufacturing sector. The research design employed both qualitative and quantitative methods to gather comprehensive data from respondents. The study used a purposive sampling technique to select 180 respondents from a total population of 300 manufacturing firms. The Unified Theory of Acceptance and Use of Technology (UTAUT) was utilized as the theoretical framework to understand the adoption and impact of EOPS. Key variables such as electronic data interchange (EDI), automated ordering, and inventory management systems were found to significantly improve supply chain performance. However, this study focused on the manufacturing sector in Bangladesh, indicating a need to explore similar effects in other geographical contexts, creating a literature gap.

In a study on the automotive manufacturing sector, Al-Doori (2019) assessed the role of Electronic Order Processing Systems and their impact on supply chain performance. DG plan goal of the research was to assess the role of EOPS towards improving the flow and responsiveness of the supply chain. The study involved the use of both the qualitative and quantitative research methods when collecting data. This study has supplemented a simple random sampling method to get 200 participant firms out of 350 automotive manufacturing firms. DOI conceptual frame was used to explain the process through which EOPS was adopted. The result showed that EDI, e-procurement, and real time order tracking was seen to have positive impact on the performance of the supply chain. However, this research was conducted within the automotive industry and therefore it is recommended that the effect of EOPS should

be studied in other manufacturing industries so that this paper addresses a literature gap.

Electronic Order Processing Systems (EOPS) have also been shown to enhance the performance of supply chains in the textile manufacturing sector (Musau, 2021). In a study on textile supply chains, Musau (2021) evaluated the impact of Electronic Order Processing Systems on the performance of the Supply Chain. The purpose of the study was to examine the performance of EOPS in a bid to facilitate supply chain management. To enhance the collection of data, the research adopted both formal quantitative and informal qualitative methods of research. The research used the stratified random sampling technique to sample 130 respondents from the total population of 220 textile manufacturing firms. The TOE framework was applied to assess the drivers of EOPS adoption. This research also reveals that EDI, electronic invoicing, and integrated supply chain management systems were effective in improving supply chain performance. Nevertheless, concern with the textile sector raises some issues, given that the current study will focus on the manufacturing sector in general.

Relationship with Supply Chain Computerised Systems on supply chain performance was also done by Hou (2020) in the electronics industry in China. The research question of the study was focused on identifying how EOPS can optimize the supply chain and minimize lead time. Data collection in the current study was done both qualitatively and quantitatively, with the use of a mixed research design. Consequently, the study adopted a stratified sampling technique targeted at a total population of 280 electronics manufacturing firms and recruited 160 respondents. Using the Resource-Based View Theory, the study focused on analyzing how EOPS

offered strategic value. EDI, automated order processing, and supply chain visibility tools have been found to enhance the supply chain performance, hence being recommended. However, this research focuses on the electronics industry in China, which has a loophole; the existing research is oriented to a vast group of manufacturing companies.

In the food and beverages manufacturing industry, Electronic Order Processing Systems (EOPS) have been found to improve supply chain coordination and reduce operational expenses. A study by Saryatmo and Sukhotu (2021) investigated the role of EOPS in enhancing supply chain performance within this sector, aiming to identify how such systems can facilitate better coordination and cost minimization. The research employed both quantitative and qualitative research methodologies in data collection. Through purposive sampling administration, 140 responses were reached from the total population of 250 food and beverage manufacturing firms. Specifically, the Institutional Theory was adopted in the research to explain the adoption and the effectiveness of EOPS. The research indicated that EDI, e-commerce integration, and automatic reorder systems highly enhanced the value of the supply chain (Jha et al.). However, this study had centered its investigation on the food and beverage industry, which left a literature gap according to the present study as these centers on the manufacturing firms in general.

2.6.2 Transportation Management Systems and Supply Chain Performance

The influence of Transportation Management Systems (TMS) on supply chain performance in the manufacturing sector in India was investigated by Kottala and Herbert (2019). The study aimed to assess how TMS can enhance transportation efficiency and overall supply chain effectiveness. The research design incorporated

both qualitative and quantitative methods to gather comprehensive data from respondents. A purposive sampling technique was employed to select 180 respondents from a total population of 300 manufacturing firms. The study utilized the Theory of Constraints (TOC) as the theoretical framework to understand the constraints in transportation and the potential improvements through TMS implementation. Key variables such as route optimization, real-time tracking, and freight cost reduction were found to significantly enhance supply chain performance. However, this study focused solely on the manufacturing sector in India, suggesting a need to explore similar effects in other geographical contexts, thereby presenting a literature gap.

Within the pharmaceutical manufacturing sector in China, Transportation Management Systems (TMS) have been studied for their potential to optimize transportation functions and improve overall supply chain performance. Moons et al., (2019) investigated whether there is an optimal approach to using TMS to enhance both transportation efficiency and the broader supply chain. This research used both qualitative and quantitative data collection methods to achieve its objectives. Respondents for this study were identified through the use of a stratified sampling technique in which 200 surveys out of a total 350 pharmaceutical manufacturing firms were selected. To conduct the assessment of the effect of TMS on transportation operations, the Lean Six Sigma method was used. This study found that route optimization, carrier collaboration and shipment visibility bear a major factor towards improvement of supply chain performance. However, this study concentrates only on the pharmaceutical industry in China, while the current research will provide a cross-sectional of the manufacturing sector as a whole.

In the automotive manufacturing sector in South Korea, Transportation Management Systems (TMS) have been evaluated for their role in optimizing transportation and enhancing supply chain flexibility. Lee (2021) investigated the implementation of TMS in this context, aiming to assess its effectiveness in improving transportation efficiency and overall supply chain performance. The research design in the current study involved both qualitative and quantitative methods for data analysis. This study used a random sampling method in fixing 160 respondents from a total sample of 280 automotive manufacturing firms. With the aim of comparing the TMS adoption to other transportation modes, the study developed a Total Cost of Ownership (TCO) model. Research results showed that route optimization, mode selection and freight consolidation positively affected supply chain performance. Nevertheless, this study has its limitation in using automobile industry of South Korea as subject of analysis while the current research intends to investigate the influence of TMS in other manufacturing domain.

Transportation Management Systems (TMS) have also been studied for their indirect influence on supply chain performance in the textile manufacturing sector in Vietnam. Phan et al (2020) examined the mediating role of supply chain management in the relationship between TMS adoption and overall supply chain outcomes. The purpose of the study was to assess the extent to which TMS can enhance transportation efficiency as well as negotiating logistics costs. The data was collected both qualitatively and quantitatively in this research work. Thus, a purposive sampling technique was used to sample 140 respondents from a total of 250 textile manufacturing firms. In this study, the Resource-Based View theory commonly known as the RBV theory was used to analyse and explain how TMS can address

problems with strategic value in the firms' transportation management. The analysis of a number of the most important parameters quantified the impact of the proposed route optimization, load planning, and freight audit solutions on significant improvement of the overall supply chain performance. However, in the current research, the textile industry in Vietnam was found to be lacking from this type of study, as this study seeks to examine the impact of TMS across a larger sample of manufacturing firms.

In Taiwan's electronics manufacturing industry, Transportation Management Systems (TMS) have been examined for their potential to optimize transportation processes and improve supply chain agility. Kou, Chiang, and Chiang (2018) conducted a study aimed at assessing how TMS implementation can enhance transportation efficiency and overall supply chain performance. The research design incorporated both qualitative and quantitative methodologies for data collection and analysis. A stratified sampling method was employed to select 180 respondents from a total population of 300 electronics manufacturing firms. The study utilized the Dynamic Capabilities Theory to understand how firms can leverage TMS to adapt to changing market conditions and customer demands. Key findings indicated that route optimization, carrier management, and freight visibility significantly improved supply chain performance. However, this study's focus on the electronics industry in Taiwan presents a gap, as the current research aims to explore the impact of TMS in a broader spectrum of manufacturing sectors.

In the aerospace manufacturing industry in Spain, Transportation Management Systems (TMS) have been explored for their role in optimizing transportation processes and enhancing supply chain efficiency. Llaguno et al (2022) conducted a

study to analyze how TMS adoption can contribute to these improvements in performance. The research design incorporated both qualitative and quantitative methodologies for comprehensive data analysis. A purposive sampling technique was used to select 150 respondents from a total population of 250 aerospace manufacturing firms. The study utilized the Technology-Organization-Environment (TOE) framework to understand the factors influencing TMS adoption and its impact on supply chain performance. Key findings indicated that route optimization, real-time tracking, and carrier collaboration significantly enhanced supply chain performance. However, this study's focus on the aerospace industry in Spain presents a gap, as the current research aims to explore the influence of TMS in a broader spectrum of manufacturing sectors.

2.6.3 Automated Warehousing Systems and Supply Chain Performance

Studies have established that automated warehousing systems influences supply chain performance in different contexts. The impact of Automated Warehousing Systems (AWS) on supply chain performance in the manufacturing sector in India was examined to assess how AWS adoption can enhance warehouse operations and overall supply chain effectiveness (Damtew & Goshu, 2024). The research design incorporated both qualitative and quantitative methods to gather comprehensive data from respondents. A stratified sampling technique was employed to select 200 respondents from a total population of 350 manufacturing firms. Key variables such as warehouse automation, inventory accuracy, and order fulfillment speed were found to significantly improve supply chain performance. However, this study focused solely on the manufacturing sector in India, indicating a need to explore similar

effects in other geographical contexts and manufacturing industries, thereby presenting a literature gap.

Automated Warehousing Systems (AWS) have been investigated for their potential to optimize warehouse operations and enhance supply chain efficiency in China's automotive manufacturing industry. Fatorachian and Kazemi (2021) conducted a study to examine how AWS implementation influences overall supply chain performance. The research employed a mixed-method approach, combining both qualitative and quantitative data collection techniques. A purposive sampling technique was used to select 180 respondents from a total population of 300 automotive manufacturing firms. The study applied the Lean Six Sigma methodology to evaluate the impact of AWS on warehouse operations. The findings revealed that automated storage and retrieval systems, inventory tracking technologies, and order picking automation significantly contributed to enhanced supply chain performance. Nonetheless, this study's focus on the automotive industry in China highlights a gap, as the current research aims to investigate the influence of AWS in other manufacturing sectors.

The influences of AWS on supply chain performance were investigated by Nguyen (2020) in electronics manufacturing industries of Vietnam. The purpose of the research was to evaluate how the integration and use of AWS can help to improve the operational flow of a warehouse and increase supply chain responsiveness. Traditional and non-traditional research techniques of the market research were used to gather both qualitative and quantitative data. In the study, respondents were selected using a stratified sampling technique, where 160 out of the 280 electronics manufacturing firms were selected. This paper is based on the research on the

Resource-Based View (RBV) theory, which was used to analyse how AWS can assist firms in obtaining strategic assets in warehouse management. This paper's findings revealed that automation in materials handling, visibility of inventory in real-time, and order accuracy contributed to enhanced supply chain operation. However, the involvement of electronics industry in Vietnam only revealed a research gap, thus, the current research investigates the implications of AWS in a variety of manufacturing industries.

In the food and beverage manufacturing industry in Mexico, Automated Warehousing Systems (AWS) have been examined for their potential to improve decision-making and overall supply chain performance. Njiru et al (2024) focused on assessing how warehouses can leverage AWS to enhance operational processes while reducing expenses. To ensure that the data was well analyzed, the research design assessed the use of both qualitative and quantitative data analysis tools. In the present study, the researchers used the random sampling technique. The researcher used a total of 140 respondents out of 250 firms in the food and beverage manufacturing industries. To examine the organizational factors that shape adoption decisions towards AWS, the study borrowed from the Institutional Theory. Key results suggested that the implementation of intelligent transportation systems, warehouse automation, and inventory tracking systems facilitated the enhancement of the supply chain. However, the current study omits examination of other sectors of manufacturing industries; this study focuses on the Food and Beverage industry in Mexico, therefore creating a gap in the current research, where the impact of AWS is being tested on a range of manufacturing industries.

In Taiwan's textile manufacturing industry, Automated Warehousing Systems (AWS) have been studied for their potential to improve warehouse throughput and reduce lead times. Zaman et al (2023) conducted research using both qualitative and quantitative methods to evaluate how AWS implementation can enhance supply chain effectiveness. A purposeful sampling method was applied to sample 170 participants from an entire population of 300 textile manufacturing firms. Major conclusions showed that automatic picking solutions, thorough optimization problems with inventories, and warehouse robots allowed for achieving higher effectiveness of the supply chain. However, the current wave of research is pointing to the real-life concern and is based on the general issues of various manufacturing sectors, not limited to the textile industry in Taiwan, whereas this study has shown the positive impact of AWS.

Automated Warehousing Systems (AWS) have been examined for their role in enhancing the efficiency of supply chain operations in China's pharmaceutical manufacturing industry. Abideen and Mohamad (2021) conducted a study to assess how AWS adoption contributes to improved performance in this sector. This paper is focused on the identification of the benefits that are being offered by the AWS adoption to effectively identify the ways for enhancing the warehouse functionality, as well as supply chain processes. This research work adopted a blended research approach, in which both the descriptive and inferential research instruments were used. Consequently, a stratified sampling technique was employed to sample 190 participants out of a total population of 320 pharmaceutical manufacturing firms. The study deployed the DOI theory to assess the patterns of AWS adoption. The research established that automated storage, inventory tracking, and order fulfillment

automation improved the supply chain performance. However, there is a limitation that, for this study, the focus was solely on the pharmaceutical industry of China; the current research will try to establish the impact of AWS across a wide range of manufacturing industries.

2.6.4 Inventory Management Systems and Supply Chain Performance

Findings on how inventory management systems influence supply chain management has been established in literature. The impact of Inventory Management Systems (IMS) on supply chain performance in the manufacturing sector in Nairobi was investigated to determine how IMS adoption can enhance inventory control and overall supply chain effectiveness (Odhiambo & Kihara, 2018). The research design incorporated both qualitative and quantitative methods to gather comprehensive data from respondents. A stratified sampling technique was employed to select 150 respondents from a total population of 100 manufacturing firms in Nairobi. Key variables such as inventory accuracy, demand forecasting, and stock-out reduction were found to significantly improve supply chain performance. However, this study focused solely on the manufacturing sector in Nairobi County, indicating a need to explore similar effects in other Uasin Gishu contexts and manufacturing industries, thereby presenting a literature gap.

Inventory Management Systems (IMS) in Uganda have been investigated for their potential to optimize inventory management processes and enhance supply chain efficiency in the agricultural manufacturing industry. Gołaś (2020) conducted a study to examine how IMS implementation influences overall supply chain performance. The research employed a mixed-method approach, combining both qualitative and quantitative data collection techniques. A purposive sampling technique was used to

select 180 respondents from a total population of 300 agricultural manufacturing firms. The study applied the Lean Six Sigma methodology to evaluate the impact of IMS on inventory management operations. The findings revealed that real-time inventory tracking, demand forecasting tools, and inventory optimization algorithms significantly contributed to enhanced supply chain performance. Nonetheless, this study's focus on the agricultural industry highlights a gap, as the current research aims to investigate the influence of IMS in a broader spectrum of manufacturing sectors.

In the textile manufacturing sector in Kisumu County, Inventory Management Systems (IMS) have been examined for their role in improving inventory control and reducing operational costs. Wamuyu and Ratemo (2024) conducted a study to analyze the effect of IMS adoption on supply chain performance in this context. The research design involved both qualitative and quantitative data collection methods. A stratified sampling method was used to select 170 respondents from a total population of 280 textile manufacturing firms. The study utilized the Technology Acceptance Model (TAM) to understand the factors influencing IMS adoption among firms. Key findings indicated that barcode scanning systems, automated replenishment processes, and inventory turnover optimization significantly improved supply chain performance. However, this study's focus on the textile industry in Kisumu County indicated a gap, as the current research aims to explore the impact of IMS in a broader spectrum of manufacturing sectors.

The role of Inventory Management Systems on the performance of the supply chain in the food processing industry in Nyeri County was examined (Nthia, 2023). The study explored how IMS can assist in managing inventory and enhancing supply chain agility. As a method, the study integrated both quantitative and qualitative research

that was used to collect and analyze data. Using the random sampling method, the target participants of 160 from the total of 250 food processing firms were chosen. By using the Resource-Based View (RBV) theory to analyze IMS, the research aimed to establish strategies that will create strategic value for IMS firms in inventory management. The findings depicted also that real time stock availability, use of batch tracking system, automatic reorder points enhance the performance of the supply chain. However, there is gap in this study concentrating on the food processing industry in Nyeri County, Kenya as the current research seeks to examine the role that IMS play in a wide prospect of the manufacturing industries.

In the pharmaceutical manufacturing industry, Inventory Management Systems (IMS) have been investigated for their potential to optimize inventory management processes and enhance supply chain efficiency. Chebet and Kitheka (2019) conducted a study to examine how IMS implementation influences overall supply chain performance in this sector. The research design incorporated both qualitative and quantitative methodologies for comprehensive data analysis. A stratified sampling method was used to select 190 respondents from a total population of 320 pharmaceutical manufacturing firms in Uasin Gishu County. The study utilized the Diffusion of Innovations (DOI) theory to understand the adoption process of IMS. The findings revealed that batch tracking systems, expiry date management tools, and inventory optimization algorithms significantly enhanced supply chain performance. However, this study's focus on the pharmaceutical industry presents a gap, as the current research aims to explore the influence of IMS in a broader spectrum of manufacturing sectors.

The impact of Inventory Management Systems on supply chain performance in the construction materials manufacturing industry was assessed (Mondol, 2021). The study sought to determine how IMS adoption could optimize inventory control processes and reduce lead times. The research employed a mixed-method approach, combining both qualitative and quantitative data collection techniques. A purposive sampling technique was used to select 200 respondents from a total population of 300 construction materials manufacturing firms. The study applied the Technology Acceptance Model (TAM) to understand the factors influencing IMS adoption among firms. Key findings indicated that barcode scanning systems, real-time inventory tracking, and automated reorder points significantly contributed to improved supply chain performance. Nonetheless, this study's focus on the construction materials manufacturing industry indicated a gap, as the current research aims to explore the influence of IMS in a broader spectrum of manufacturing sectors.

2.6.5 Enterprise Resource Planning (ERP) and Supply Chain Performance

The relationship between these variables has been established extensively in the literature. The influence of ERP implementation on supply chain performance was the focus of a study conducted by Koh et al. (2022). The study used a survey and descriptive research design to investigate the impact of ERP implementation on supply chain performance. The results suggest that ERP systems have a modest role in achieving supply chain integration, but can improve supply chain reliability, responsiveness, flexibility, and cost reduction. The study notes that current ERP systems may have limitations in supporting strategic supply chain management due to their single-organization scope and lack of flexibility.

In Kenya's sugar manufacturing industry, enterprise resource planning (ERP) systems have been examined for their relationship with supply chain performance (Omondi, 2019). A quantitative study was used to assess how ERP implementation influences supply chain outcomes in this sector. The results show a significant positive relationship between ERP implementation and supply chain performance measures such as flexibility, responsiveness, reliability, and cost reduction. The study suggests that other factors beyond ERP may also influence supply chain performance and recommends further research to explore these additional determinants.

Enterprise Resource Planning (ERP) systems have also been investigated for their role in supply chain management (Aziz et al., 2018). The study conducted a literature review and applied a theoretical framework to explore how ERP implementation influences supply chain operations and performance. The results indicate that ERP can improve supply chain decision-making, standardize processes, and enhance supply chain collaboration and transparency. The study notes the need for further empirical research to quantify the specific benefits of ERP on supply chain performance.

The impact of ERP systems and supply chain management practices on firm performance, using Turkish companies as a case study, was examined (Ince, et al., 2020). The study used a survey-based quantitative approach to examine the relationship between ERP, supply chain management practices, and firm performance. The results show that both ERP systems and supply chain management practices have a positive impact on competitive advantage and firm performance. The study suggests exploring the moderating effects of contextual factors on the ERP-supply chain performance relationship.

The impact of Enterprise Resource Planning (ERP) system implementation on the performance of supply chain (SC) activities within organizations, using Coca-Cola Kenya as a case study, was investigated (Nyoro, 2021). The research employed a survey-based descriptive research design to evaluate how ERP adoption influences key SC performance metrics, such as inventory management, order fulfilment, and logistics efficiency. Based on the findings, it is deduced that ERP implementation has a positive impact on supply chain performance in relation to cost, time, cultural impact, and planning/forecasting. Therefore, the study suggests that other factors affecting supply chain performance besides the implementation of ERP should be the subject of further research.

The effects of Enterprise Resource Planning (ERP) system implementation on supply chain management have also been explored through case studies (Qureshi, 2022). The study examined this relationship in the context of a manufacturing firm, focusing on how ERP adoption influences supply chain operations and performance. The outcomes suggest that the level of visibility, responsiveness and integration in the supply chain has increased after the implementation of ERP. The authors believe that future studies should be conducted across industries in order to replicate the study and consider the context.

In Australia, Enterprise Resource Planning (ERP) systems have been analysed for their influence on supply chain management (Fauzi, 2022). The study conducted a literature review and applied a conceptual framework to examine how ERP systems impact supply chain operations and performance. The results indicate that ERP can enhance supply chain integration, information sharing, and optimization of supply chain processes, leading to improved supply chain performance. The study

recommends empirical research to validate the conceptual framework and explore the moderating role of organizational factors.

Enterprise Resource Planning (ERP) systems integrate various business functions, such as procurement, production, and logistics, to streamline operations and improve overall efficiency (Irina, 2022). This integration enables firms to better manage their supply chains, leading to enhanced performance. ERP systems provide real-time visibility into the supply chain, enabling firms to track inventory levels, monitor shipments, and manage logistics more effectively (Helo & Shamsuzzoha, 2020). This visibility helps to reduce delays and improve delivery times, ultimately enhancing supply chain performance.

Enterprise Resource Planning (ERP) systems facilitate collaboration among different departments and stakeholders within the organization, as well as with suppliers and customers (Chan & Chin, 2021). This collaboration leads to better communication, reduced errors, and improved overall supply chain performance. ERP systems automate many manual processes, reducing the need for manual data entry and minimizing the risk of errors. This automation increases efficiency, allowing firms to focus on strategic activities and improve their overall performance. ERP systems provide firms with real-time data and analytics, enabling them to make informed decisions about supply chain operations. This data-driven approach helps firms optimize their supply chains, leading to improved performance and reduced costs.

Enterprise Resource Planning (ERP) systems act as a central hub for data management and decision-making across various business functions, including logistics and supply chain management. Therefore, when coupled with EOPS, ERP

systems have the capability to enhance the efficiency and effectiveness of order processing by providing real-time data integration and analytics. This integration enables better coordination between different stages of the supply chain, leading to improved order accuracy, faster order fulfillment, and ultimately, enhanced supply chain performance (Chan & Chin, 2021).

2.6.6 Enterprise Resource Planning (ERP) as a Moderator

The choice of Enterprise Resource Planning (ERP) as a moderator in this study was guided by prior studies. The moderating role of enterprise resource planning in business model innovation was examined by comparing two groups of small and medium-sized enterprises in Spain, with the study yielding mixed results (Molina-Castillo et al., 2022). Their study recommends future research to be conducted in different contexts, focusing on large enterprises using different antecedents, as this could offer an appealing potential contribution to the field of integrating enterprise resource planning.

In Denmark, the moderating effect of ERP on the growth-profitability relationship in young SMEs was examined using both longitudinal and cross-sectional survey data (Schlichter et al., 2021). Their findings indicate that ERP significantly moderates the association between growth and return on investment (profitability) of the target firms. However, studies done by Shaiti and Al-Matari (2020) and Nugraha, Janis, and Bisri (2022) revealed that ERP does not moderate the relationship between the variables in their studies and recommendations for further studies to be carried out in different contexts to test these relationships. Thus, this study intends to fill this gap by examining the moderating role of ERP on the relationship between E-logistics and supply chain performance of manufacturing firms in Uasin Gishu County, Kenya.

The available evidence from these studies conducted in diverse contexts, including Kenya, Turkey, Sri Lanka, and Australia, consistently demonstrates that ERP implementation has a positive impact on various dimensions of supply chain performance, such as cost, efficiency, flexibility, and integration. However, the research also highlights the need for further investigation into the specific mechanisms and contextual factors that may influence the ERP-supply chain performance relationship.

Molina-Castillo et al. (2022) focused on whether ERP changes how business model (BM) experimentation translates into performance in SMEs. Cross-sectional survey of 208 Spanish SMEs engaged in BM innovation; constructs analyzed with SEM and HTMT, comparing firms with vs without ERP. The study findings revealed that for non-ERP firms, BM experimentation directly boosts BM performance; in ERP-using firms, performance uplift depends on the downstream novelty of the BM. ERP moderates the experimentation performance link via value-capture efficiency. Single-country, cross-sectional design with self-reported performance; future work should use longitudinal/archival performance and model ERP maturity/module scope, not just implementation status.

Schlichter, Klyver, and Haug (2021) studied the moderating effect of ERP system complexity on the growth–profitability relationship in young SMEs. Linked longitudinal register data with a cross-sectional survey; moderated analyses on Danish SMEs. The study findings revealed that growth improves short-run profitability when ERP complexity is low, but hurts profitability when ERP complexity is high, showing ERP complexity moderates the growth–profitability relationship. Generalizability

beyond one country and reliance on perceived complexity; future research should validate with objective ERP configurations and multi-country panels.

Sadeghi R., Ojha, and Azadegan (2025) focused on data systems in supply chain resilience: Moderating effects of enterprise resource planning. Survey of U.S. operations/IT professionals at the supply-chain relationship level; structural modeling with robustness and endogeneity checks. ERP helps attenuate the negative effect of downstream complexity on secure information sharing and strengthens the information-sharing cyber-resilience link (i.e., ERP acts as a higher-order moderator). Cross-sectional, perceptual measures and a U.S. sample; future work should triangulate with incident logs and test other complexity dimensions (upstream, network density).

Although these studies affirm ERP's positive moderating influence, empirical research within Uasin Gishu County's manufacturing sector remains limited. In particular, there is a lack of evidence exploring how ERP optimizes IMS performance across different manufacturing sub-sectors and levels of technological maturity. This highlights the need for localized, sector-specific research to better understand ERP's role in enhancing inventory management and driving firm performance in Kenya's evolving industrial landscape.

Table 2.1 Summary of Literature Reviewed and Research Gaps

Author	Topic	Methodological Approach	Findings	Gaps
Flechsig, Anslinger and Lasch, (2022)	Influence of Electronic Order Processing Systems on Supply Chain Performance	Quantitative, Regression Analysis, using a multiple case study design, involving 19 organizations from the public and private sectors in Germany. A non-probabilistic sampling and a qualitative approach were used	EOPS implementation leads to reduced cycle times, lower operational costs, and improved order accuracy and fulfillment rates in supply chain performance	Methodology used in the study was a non-probabilistic sampling strategy, which may limit the generalizability of the findings. The study was carried out in Germany, The data analysis involved a qualitative approach.
Tan and Sidhu (2022)	Influence of Transportation Management Systems on Supply Chain Performance	Quantitative, Case Study of Malaysia. The study employed a systematic literature review. The target population consisted of peer-reviewed journal articles and conference papers published between 2010 and 2021. The sampling strategy involved a multi-stage process. The data analysis involved a qualitative approach	TMS implementations lead to cost reductions, increased delivery reliability, and improved supply chain performance	The study was carried out in Malaysia, using a systematic literature review, which may limit the depth of analysis and originality of the findings. - The sampling strategy involved a multi-stage process, but it is not clear how representative the selected articles and papers are of the broader population
Riza, Purba and Mukhlisi	Influence of Transportation Management Systems on	Quantitative, Regression Analysis, employing a case	TMS adoption improves delivery times,	The study focused on a single automotive

n, (2018)	Supply Chain Performance	study research design, focusing on a single automotive industry company in Indonesia, and a purposive sampling approach. The data analysis involved both quantitative and qualitative methods	reliability, and overall supply chain performance.	industry company in Indonesia. The data analysis involved both quantitative and qualitative methods, but it is not clear how these methods were integrated and what insights each method provided.
Hr and Aithal (2020)	Influence of Automated Warehousing Systems on Supply Chain Performance	Qualitative, Case Study Experimental desi gn in India. The study does not specify the sample size, Quantitative analysis	AWS implementatio ns result in improved efficiency, reduced errors, and enhanced supply chain performance	The study was carried out in India. The study does not specify the sample size, which may raise concerns about the representativen ess of the findings. - The study employed a qualitative approach, but it is not clear how the quantitative analysis was conducted and what statistical methods were used.
Molina-Castillo *et al.* (2022)	The role of ERP in business model innovatio n: Impetus or impedime nt.	This research is based on a large quantitative study among Spanish firms that are engaged in BM innovation activities and in different phases of implementing ERP. A sample	Quantitative findings show that there is a direct positive impact of BM experimentati on on BM performance for firms that did not implement an	The study was carried out in Spanish, while the current study was done in Kenya.

		size was 208 Spanish firms engaged in Business Model Innovation from different sectors was used to collect data, which was analysed using heterotraitmonotrait (HTMT) for scaling and Structural Equation Modelling (SEM) for model testing.	ERP, while downstream novelty leads to improved value capture due to increased efficiency and the associated cost reduction.	
Onwude, Chen, Eke-Emezie, Kabutey, Khaled and Sturm, (2020)	Moderating Influence of Enterprise Resource Planning (ERP)	Mixed Methods, Literature Review, action research, Target Population were supply chain managers, logistics companies in Nigeria, and technology developers.	ERP integration enhances operational efficiency, facilitates data-driven decision-making, and drives continuous improvement initiatives in supply chain performance.	The study employed a mixed methods approach, but it is not clear how the qualitative and quantitative data were integrated to provide a comprehensive understanding of the moderating influence of enterprise resource planning. The target population of the study was limited to supply chain managers, logistics companies, and technology developers, which may limit the perspectives and insights

		gained from other stakeholders in the supply chain.

2.7 Conceptual Framework

The conceptual framework illustrates the relationship between the independent variables, the moderating variable, and the dependent variable (Kent et al,2020). The source of these variables is from prior studies. From the summary of the literature, there are some contextual, conceptual, and methodological gaps to be filled. Most of the research that has been done on e-logistics and supply chain performance has focused on direct effects only. However, there is limited evidence from the literature on the moderating influence of ERP on the relationship between E-logistics and supply chain performance. Hence, the study fills the identified gaps by developing Figure 2.1 as its conceptual framework.

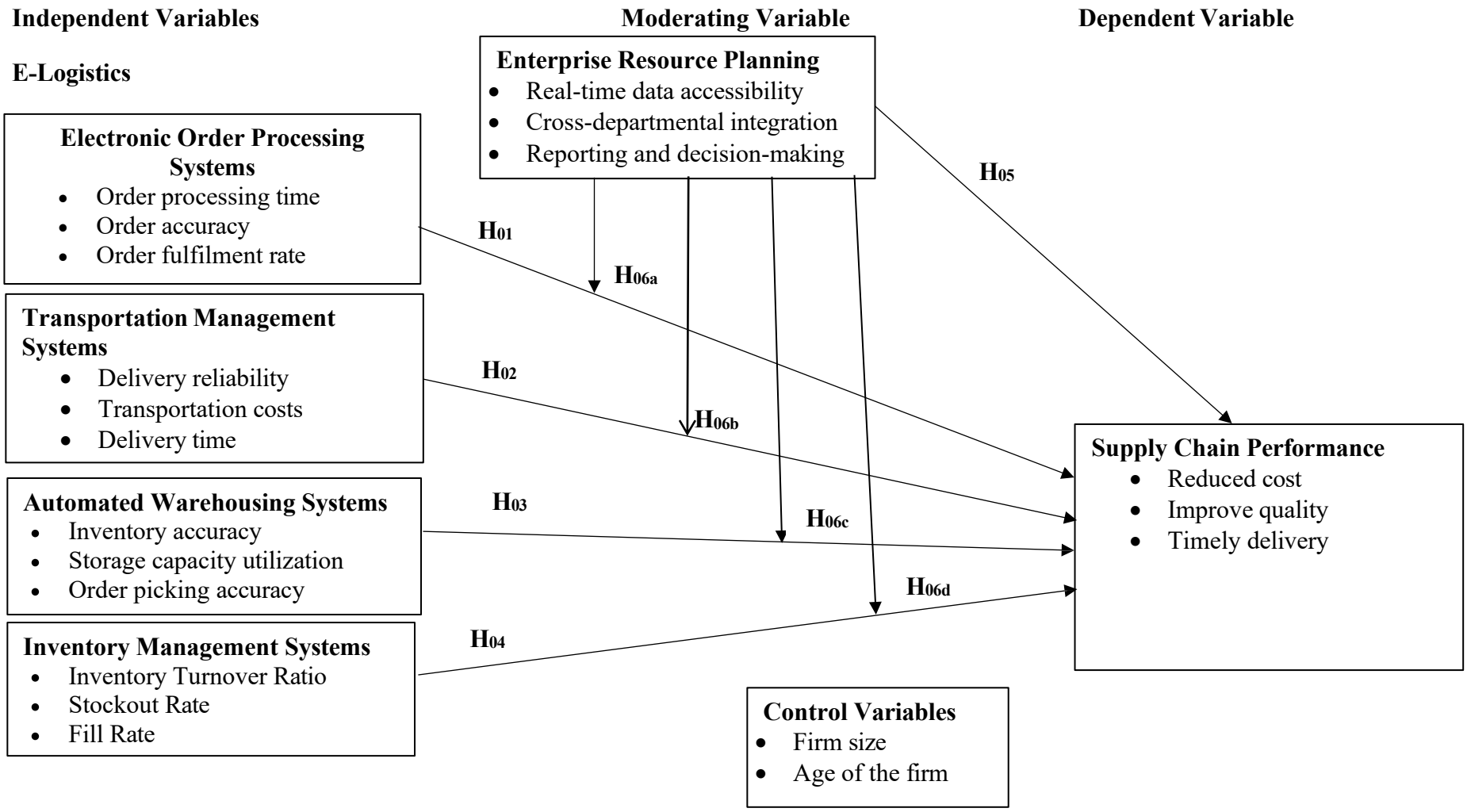

Figure 2.1 Conceptual Framework

CHAPTER THREE

METHODOLOGY

3.1 Overview

This chapter describes the methodology that was used in conducting the study. It includes research design, study area, target population, sample size, sampling techniques, data collection instruments, measurements of variables, validity and reliability of the instruments, data collection procedures, data analysis and presentation, assumptions of regression model and ethical considerations.

3.2 Research Design

A research design is the overall plan or structure that guides the process of conducting research (Abbott & McKinney, 2013). Research design can also be of several types, for instance, descriptive research design, which mainly aims at conveying the mode of a given phenomenon, population, or even situation. The study employed an explanatory research design to examine the effect of e-logistics, enterprise resource planning (ERP) on the supply chain performance of manufacturing firms in Uasin Gishu County, Kenya. Explanatory research aims to identify the causal relationships between variables, which is crucial in understanding how logistics, enterprise resource planning, and supply chain performance interact and impact each other. This design helps to establish the underlying mechanisms and processes that contribute to the observed outcomes. The findings from an explanatory research design can provide actionable insights that inform strategic decisions for manufacturing firms in Uasin Gishu County. By identifying the most effective logistics, enterprise

resource planning, and supply chain strategies, firms can optimize their operations and improve overall performance. This design is appropriate as it allows for the collection of quantitative data for testing of causal effect.

3.3 Study Area

The study was conducted in Uasin Gishu County, which is located in the Rift Valley region of Kenya. The county is selected due to its high concentration of manufacturing firms and its economic significance in the region. Uasin Gishu County is known as a major industrial hub in Kenya, particularly for agricultural processing (Awino, 2021). This concentration of manufacturing firms allows you to gather data from a diverse range of companies within a defined geographical area. Studying a specific county allows you to delve deeper into the unique challenges and opportunities faced by manufacturers in that region. This can provide richer insights compared to a broader national study.

3.4 Target Population

The target population is the entire group of people or elements that a study aims to analyze and draw conclusions about (Asiamah et al., 2017). It is the master blueprint for the sample and defines the overall set of all items with specific characteristics that the researcher wants to investigate (Banerjee & Chaudhury, 2010). The target population for this study consisted of all 30 manufacturing firms in Uasin Gishu County, Kenya (Appendix V). The specific respondents were 1 Head of Department from 9 departments, whose functions are closely related to the study variables in each of the 30 firms, hence $9 \times 30 = 270$. These include 30 supply chain heads of department, 30

logistics heads of department, 30 operations and production heads of department, 30 engineering heads of department, 30 total quality heads of department, 30 material handling heads of department, 30 marketing heads of department, 30 finance heads of department, and 30 ICT heads of department. One from each firm gives us a total of 270 respondents as presented in Table 3.1.

Table 3.1 Target population

Category	**Target Population**	Respondents
Supply chain head of department	30	1
Operations head of department	30	1
Production head of department	30	1
Total Quality management head of	30	1
Material handling head of department	30	1
Marketing head of department	30	1
Logistics head of department	30	1
Finance head of department	30	1
ICT head of department	30	1
Total	270	9 × 30

3.5 Census

A census approach was used to include 270 respondents from manufacturing firms in Uasin Gishu County, as the population is relatively small and manageable. The census approach allowed for efficient data collection, as it involves gathering information from all firms in the population. This approach guarantees the collection of comprehensive and representative data for the

entire population (Skinner, 2018). Since the target population is small, the entire population was sampled.

3.6 Data Collection Instruments

The primary data collection tool used in this study was a self-administered questionnaire. This instrument was chosen because it allows for the efficient collection of standardized data from a large group of respondents, making it ideal for studies involving multiple variables such as this one. The self-administered nature of the questionnaire also ensures that respondents can complete it at their convenience, thereby reducing interviewer bias and encouraging honest responses. Additionally, the structured format of a questionnaire facilitates quantitative analysis, which is essential for measuring relationships between e-logistics practices, ERP implementation, and supply chain performance.

The questionnaire was carefully structured to align with the objectives of the study and was divided into three key sections. The first part was designed to collect demographic data, such as gender, age, education level, and employment history of the respondents. This information helps to contextualize the findings and assess whether personal characteristics influence responses related to supply chain practices. The second part of the questionnaire focused on evaluating the supply chain performance of manufacturing firms in Uasin Gishu County. This section aimed to capture the operational effectiveness and efficiency levels within the firms, providing a baseline against which the impact of digital logistics systems could be assessed.

The third part addressed the core research objectives, gathering data on specific components of e-logistics and ERP. These components included the influence of electronic order processing systems, transportation management systems, automated warehousing, inventory management systems, and Enterprise Resource Planning tools on supply chain performance. This section was central to examining the relationship between technology adoption and operational outcomes in the manufacturing sector.

All items in the questionnaire were measured using a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). This scale was selected for its ability to effectively capture the intensity of respondents' opinions and perceptions, allowing for nuanced analysis of trends and correlations within the data.

3.7 Measurements of Variables

The measurements of variables in this study were adopted from previous studies and modified to suit the current study. Two covariates, firm age and firm size, were also controlled during the analysis since the literature shows that they influence supply chain performance (Yang et al.,2008; Younis & Sundarakani, 2019). The independent variables e-logistics and ERP, and the dependent variable supply chain performance were both measured on a 5-point Likert scale; 1= strongly disagree and 5=strongly agree. This is captured based on the objectives under the method of data collection in Table 3.2.

Table 3.2 Measurement of Variables

Type	Variable	Items	Measurement scale	Sources
Dependent Variable	Supply chain performance	7	5-point Likert scale	Arshad et al. (2013),
Independent Variable	Electronic order processing system	7	5-point Likert scale	Velicogna et al. 2017
Independent Variable	Transportation management system	7	5-point Likert scale	Tijan et al. (2020).
Independent Variable	Automated warehousing system	7	5-point Likert scale	Staudt et al. (2015)
Independent Variable	Inventory management system	7	5-point Likert scale	Ayochok & Perez (2024).
Moderating variable	Enterprise resource planning	7	5-point Likert scale	Jayeola et al. (2022).

3.8 Pilot Study

A pilot study was conducted in three manufacturing firms in Nakuru County; Coca-Cola Company, Mega Park Ltd, and Prime Mattresses prior to the main study. The purpose of the pilot study was to assess the validity and reliability of the research instruments. Questionnaires were distributed to respondents from these firms, representing 10% of the total sample size, in line with the recommendation by Doody and Doody (2015). Nakuru County was selected for piloting because its manufacturing firms share similar characteristics with those in Uasin Gishu County, the main study area. The pilot study enabled the researcher to evaluate the consistency of the responses, identify ambiguities or weaknesses in the questionnaire items, and revise the instruments accordingly. The results confirmed the instruments' suitability for use in the main study.

3.8.1 Reliability of Research Instruments

Reliability is the consistency of measurement, or the degree to which an instrument measures the same way each time it is used under the same condition with the same subjects (Cronbach, 1951). The researcher used an internal consistency measure known as Cronbach's alpha (α). It indicated the extent to which a set of test items can be treated as measuring a single latent variable. The recommended value of 0.7 was used as a cut-off of reliabilities. Cronbach's alpha is a general form of the Kunder-Richardson (K-R) 20 formulas used to access internal consistency of an instrument based on split-half reliabilities of data from all possible halves of the instrument.

Table 3.3 indicates the outcome of the pilot study with all items and the entire measuring instrument having a Cronbach's alpha score above the recommended 0.7 implying the instrument was reliable.

Table 3.3 Reliability Test for Pilot Study

Name of Variable	Number of Items	Cronbach's alpha Score
Supply Chain Performance	7	.921
Electronic Order Systems	7	.897
Transport Management System	7	.875
Automated Warehousing System	7	.869
Inventory Management System	7	.930
Enterprise Resource Planning	7	.957
Overall Cronbach's alpha Score	**42**	**.967**

3.8.2 Validity of Research Instruments

Validity refers to the extent to which a method accurately measures what it is designed to measure (Almanasreh, Moles & Chen, 2019). There are several types of validity that are crucial in ensuring the accuracy of research findings. Face validity is a type of validity that assesses whether a test or scale appears to measure what it is supposed to measure (Clark & Watson, 2019). It involves subjective judgments by experts to determine if the test items seem logically related to the construct under study. Content validity is a type of validity which evaluates whether a test or scale measures all the components of a given construct (Almanasreh, Moles & Chen, 2019). It involves ensuring that the test includes items that assess every domain of the construct, as determined by subject matter experts.

Construct validity is a type of validity which examines whether a measurement tool truly assesses what it is designed to assess (Tavakol & Wetzel, 2020). Others include cross validity and reliability with which the performance of the tool in measuring the intended construct is established. Criterion validity also known as concurrent validity refers to the extent to which the test measures a specific outcome for which it has been developed (Hayashi, Abib & Hoppen, 2019). They are predictive validity, concurrent validity, convergent validity and discriminant validity. To get these types of validity, researcher used expert panels in face and content validity. The analysis of the assessment information to guarantee that many facets of the construct are represented by the test items. Carrying out research to test relationships between two or more variables that all measure the same phenomenon. This method works by comparing the final

results with actual values in as an effort to make sure that it is actually accurate.

The measuring tools were provided to the supervisors and other specialized lecturers for purposes of validity test before conducting a field study to collect real data. Referring with the view of Mohamad, Sulaiman, Sern and Salleh, (2015), the researcher has to sought the opinion of person with intelligent judgment regarding their adequacy. To establish content validity in the quantitative questions the researcher calculated the number of items checked relevant against the objectives divided by the total items in the questionnaires. When calculated on percentage, any figure above 50% gives credibility to the instrument (Creswell & Creswell, 2017). Before applying the questionnaire for data collection, the researcher consulted with the supervisors and some of the colleagues. Some of their opinions during pilot study were used to enhance the research instrument for the final study.

3.9 Data Collection Procedures

The researchers obtained a letter of introduction from the university and a research permit from the National Commission for Science, Technology and Innovation (NACOSTI) before commencing data collection. On the set date, questionnaires were administered directly to the respondent using the drop and pick method and a follow up was conducted by the researcher to ensure the questionnaires are filled in accordance with the research. The respondents were given enough time to complete copies of the questionnaire before picking them for analysis. The questionnaire included closed-ended questions. This

allowed the respondents to give their own views. The researcher explained the purpose of the visit to the respondents.

3.10 Data Analysis and Presentation

Data collected were analyzed using descriptive and inferential statistics. Descriptive statistics were frequency, percentages, means, and standard deviations while inferential statistics was correlation and regression analysis. Hierarchical regression was used to test for moderation. Data analysis was done with aid of Statistical Package for Social Scientists (SPSS) version 25.

Correlation analysis was used to assess the strength and direction of the relationships between the variables (Gogtay & Thatte, 2017). The correlation analysis provided insights into how different dimensions of e-logistics ERP are correlated with various aspects of supply chain performance. It helped to quantify the strength of the moderating effect and identify areas where ERP has a positive or negative influence. Hierarchical linear regression was used to model the relationship between a dependent variable and multiple independent variables, while accounting for the hierarchical structure of the data. It allowed the researcher to assess the unique contribution of each set of predictors to the variance in the outcome variable.

Hierarchical regression is a type of multiple regression where predictors are entered into the model in a specific order, creating a hierarchy of models (Baron & Kenny, 1986). The first block often includes "control variables" that are held constant to isolate the effect of the predictors of interest.

The key steps are:

Evaluate the regression models being compared

Determine if the hierarchical regression model is a good fit

Look at R-squared, change in R-squared, and significance

3.10.1 Regression Model Specification

Model 1: $Y= \beta_0 + \beta_1$Firm Age $+ \beta_2$Firm size $+ \varepsilon$……. …Eq..1 Testing the effect of the controls on supply chain performance and the variance (R^2) they account for in supply chain performance.

Model 2: $Y = \beta_0 + C + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$…. Eq. 2-Meant to test the direct effect of the independent variables on the outcome variable.H_{01}- H_{04}

Model 3: $Y= \beta_0 + C+ \beta_1 X_1+ \beta_2 X_2+ \beta_3 X_3+\beta_4 X_4+ \beta_5 Z +\varepsilon$…Eq. 3-To test the effect of the moderator on the dependent variable H_{05}

Model 4: $Y= \beta_0 + C+ \beta_1 X_1+ \beta_2 X_2+ \beta_3 X_3+\beta_4 X_4+ \beta_5 Z+ \beta_6 Z *X_1+\varepsilon$…Eq. 4. Testing the 1st moderation hypothesis H_{06a}

Model 5: $Y= \beta_0 + C+ \beta_1 X_1+ \beta_2 X_2+ \beta_3 X_3+\beta_4 X_4+ \beta_5 Z+ \beta_6 Z *X_1+ \beta_7 Z *X_2+\varepsilon$. Eq. 5. Testing the 2nd interaction of the moderation process…H_{06b}

Model 6: $Y= \beta_0 + C+ \beta_1 X_1+ \beta_2 X_2+ \beta_3 X_3+\beta_4 X_4+ \beta_5 Z+ \beta_6 Z *X_1+ \beta_7 Z *X_2+ \beta_8 Z *X_3+\varepsilon$…Eq.6

This is meant to examine the 3rd moderation process…H_{06C}

Model 7: $Y= \beta_0 + C+ \beta_1 X_1+ \beta_2 X_2+ \beta_3 X_3+\beta_4 X_4+ \beta_5 Z+ \beta_6 Z *X_1+ \beta_7 Z *X_2+ \beta_8 Z *X_3+ \beta_9 Z *X_4+\varepsilon$. Eq.7…Intended to test the moderation process of H_{06d}

Where:

$\boldsymbol{Y}$= supply chain performance;

$\boldsymbol{\beta_0}$= intercept or constant term;

From $\boldsymbol{\beta_1}$,to β_9 represents the regression model's coefficients;

$\boldsymbol{x_1}$ = electronic order processing system

$\boldsymbol{x_2}$= transportation management system

$\boldsymbol{x_3}$= automated warehousing system

$\boldsymbol{x_4}$= inventory management system

$\boldsymbol{\varepsilon}$ = error term in the model.

Z= Moderator (enterprise resource planning)

The results were presented using tables, charts, and graphs.

3.11 Testing the assumptions of Regression Model

Assumptions of multiple regression, such as normality, linearity, multicollinearity, and homoscedasticity, were tested before conducting the regression analysis.

Linearity: The connection between the dependent variable and each of the independent variables should be of a linear nature (Marshall, Vollmer & Orchard, 2022). This was checked by means of correlation to verify the linear relationships between the study variables and the dependent variable. Normality: The data represented by the residuals of the observations and the values predicted by the model should be close to normal, as represented on the Histogram, and supported by Skewness and Kurtosis statistics below respectively.

Homoscedasticity: The mean of the residuals ought to be constant at all levels of the independent variables (Đalić & Terzić, 2021). Namely, this assumption was investigated through the creation of the scatter plot. Multicollinearity: The independent variables should not be too much related with the other variables (Kim, 2019). The presence of multicollinearity was tested by ordinarily using coefficient Cross Validity Index (CVI), Variance Inflation Factor (VIF), and Tolerance for each of the independent variables. It was observed that the value of VIF was grater to 10 and Tolerance is below 0.2 which indicated that the variable is highly correlated with other independent variables and can be excluded from any modelakens.

3.12 Ethical Considerations

The researcher obtained an introductory letter from University of Eldoret that was presented to the National Commission for Science Technology and Innovation (NACOSTI). Confidentiality of respondents in the study was strictly adhered to at all times. The researcher used an informed consent sheet which contains phrases indicating that the study participation is voluntary, the objectives of the study, the study procedures, the selection criteria, the anticipated benefits of their involvement, any risk, assurance of the confidentiality aspect, and privacy during data collection. After the respondents have read and comprehended the informed consent, the respondents are requested to indicate their voluntary participation by signing the informed consent sheet.

CHAPTER FOUR

DATA PRESENTATION ANALYSIS AND INTERPRETATION

4.1 Overview

This chapter includes the data analysis that was done. The data were analyzed using both descriptive statistics, which included means and standard deviations, and inferential statistics, which included correlation and regression. Tables were used to present the results.

4.2 Response Rate

Response rates reflect the percentage of individuals who complete a questionnaire relative to the total number sampled. The study findings revealed that out of the 270 administered questionnaires, 243(90%) were fully completed and were found to be useful for further analysis, while 27(10%) were not returned by the sampled respondents. This response rate was deemed satisfactory as suggested by Field (2013), who recommends 75% as a rule of thumb for minimum responses. This response rate is considered satisfactory and is comparable to research on similar topics. Table 4.1 indicates the findings.

Table 4.1 Response Rate

Responses	No.	Percentages
Administered	270	100
Returned questionnaires	243	90
Unreturned questionnaires	27	10

4.3 Background Information of the Respondents

The researcher sought to get information on the background of the respondents

4.3.1 Gender of the Respondents

The study sought to establish the gender of the respondents. From the findings majority of 133(54.7%) of the respondent were males while 110(45.3%) were females. This indicated that both genders were represented in the study hence there was no bias in the study as presented in Table 4.2.

Table 4.2 Gender of the Respondents

Gender	Frequency	Percent
Male	133	54.7
Female	110	45.3
Total	**243**	**100.0**

4.3.2 Age Bracket of the Respondents

The respondents were requested to indicate their age. The study findings revealed that the majority of the respondents 77(31.7%) were aged between 31 - 35 years, 70(28.8%) were aged between 26-30 years, 62(25.5%) were between aged above 36 years. However, 29(11.9%) were having the age range between 21-25, and finally 5(2.1%) were below 20 years of age. This means that most of the respondents were aged between 31 to 35 years, followed closely by those aged between 26 to 30 years, implying that the respondents were experienced enough to give the correct responses on the topic. It was distributed as shown in Table 4.3.

Table 4.3 Age Bracket of the Respondents

Age	Frequency	Percent
Below 20 Years	5	2.1
21-25 years	29	11.9
26-30 years	70	28.8
31-35 years	77	31.7
Above 36 years	62	25.5
Total	**243**	**100**

4.3.3 Education Level of the Respondents

The researcher also assesses the education level of the respondents. From the result, 115(47.3%) of the respondents had a diploma, who were followed by those holding certificates, 56(23.0%). Additionally, 26 (10.7%) had a high school certificate, while 41(16.9%) of the respondents had an undergraduate level of education, and finally, PhD holders had only 1 respondent representing 0.4%. Results indicate that the majority of the respondents had learned, and therefore they could understand the questions of the items measuring the study variables. Table 4.4 presents the study results.

Table 4.4 Education Level of the Respondents

Education level	Frequency	Percent
High school	26	10.7
Certificate	56	23.0
Diploma	115	47.3
Undergraduate	41	16.9
Master's Degree	4	1.6
PHD	1	.4
Total	**243**	**100.0**

4.3.4 Number of Years the Firm Has Been in Operation

The researcher sought to determine the number of years the firm has been operating its business. Study findings showed that 128(52.7%) of the respondents reveals that the firm has been operating a period of 11 to 15 years, 77(31.7%) showed that the firm has been operating for a period of over 16 years, 23(9.5%) had an experience of 11-15 years and finally 15(6.2%) showed that the firm has been operating for a period of less than 5 years. This implies that the majority of the respondents reveal that the firm has been operating for a period of 11 to 15 years. Table 4.5 presents the study results.

Table 4.5 Number of years the firm has been operating.

Category	Frequency	Percent
Below 5 years	15	6.2
6-10 years	23	9.5
11-15 years	128	52.7
Above 16 years	77	31.7
Total	**243**	**100.0**

4.3.5 Number of Employees Working for the Company

This analysis took into account the total number of employees working for the company. Results revealed that most of the manufacturing firms in Uasin Gishu County had employees more than 200 which represented 81.1%, which were followed by 22 (9.1%) firms having between 101 and 200 employees, while those below 100 and 51 employees were 11 (4.5%), and finally, 13(5.3%) of the firms had employees less than 50. The number of employees

was used to measure firm size in this study. The results were displayed in Table 4.6.

Table 4.6 Number of Employees Working for the Company

Category	Frequency	Percent
Below 50 employees	13	5.3
51-100 employees	11	4.5
101-200 employees	22	9.1
Above 201 employees	197	81.1
Total	**243**	**100.0**

4.4 Descriptive Analysis

This study examined the descriptive statistics for the dependent variable moderator, and the independent variable. The analysis encompassed the calculation of the mean, frequencies, percentages, and standard deviation, as indicated by the subsequent data.

4.4.1 Descriptive Statistics for Electronic Order Processing System

The study sought to assess the influence of the electronic order processing system on the supply chain performance of manufacturing firms in Uasin Gishu County, Kenya. A total of 7 statements were used and responses elicited on a 5-point Likert scale. The study findings indicated that the majority of the respondents agreed that the electronic order processing system has improved communication and collaboration between departments (sales, production, and inventory with a mean rating of 4.19 and a standard deviation of 0.92. Furthermore, the majority of the respondents agreed that the electronic order

processing system has increased customer satisfaction by providing faster order fulfillment, with a mean of 4.19 and a standard deviation of 0.99.

Further, the study's findings revealed that the majority of the respondents agreed that their electronic order processing system integrates seamlessly with other enterprise resource planning (ERP) systems within the company (mean=4.17, standard deviation=1.01). The study's findings also revealed that the majority of the respondents agreed that the system provides real-time inventory visibility, enabling efficient production planning with a mean rating of 4.14 and a standard deviation of 0.98. The study further revealed that the majority of the respondents agreed that the system offers easy access to order history and tracking information for both internal and external stakeholders, with a mean of 4.11 and a standard deviation of 1.08. Further, the study findings indicated, the majority of the respondents agreed that the electronic order processing system in our firm allows for quick and accurate order entry, with a mean of 4.10 and a standard deviation of 1.15. Finally, study results showed the majority of the respondents agreed that the system automates order processing tasks, reducing manual errors and processing time with a mean of 4.07 and a standard deviation of 1.00. The results are presented in Table 4.7.

Table 4.7 Descriptive Statistics for Electronic Order Processing System

Statements	Mean	Std. Dev
1. The electronic order processing system has improved communication and collaboration between departments (sales, production, and inventory).	4.19	.921
2. The electronic order processing system has increased customer satisfaction by providing faster order fulfillment.	4.19	.985
3. Our electronic order processing system integrates seamlessly with other enterprise resource planning (ERP) systems within the company.	4.17	1.012
4. The system provides real-time inventory visibility, enabling efficient production planning.	4.14	.978
5. The system offers easy access to order history and tracking information for both internal and external stakeholders.	4.11	1.078
6. The electronic order processing system in our firm allows for quick and accurate order entry.	4.10	1.154
7. The system automates order processing tasks, reducing manual errors and processing time.	4.07	.997

4.4.2 Descriptive Statistics for Transportation Management System

The researcher sought to establish the influence of the transportation management system on the supply chain performance of manufacturing firms in Uasin Gishu County, Kenya. A total of 7 statements were used and responses elicited on a 5-point Likert scale. The study findings showed that the majority of the respondents agreed that the TMS effectively tracks and

manages inbound and outbound shipments (Mean =3.95, Std. dev=1.19). Further, the majority of the respondents agreed that the TMS optimizes transportation routes, leading to reduced delivery times and costs (Mean =4.02, Std. dev=1.06). Analysis revealed that the majority of the respondents agreed that the TMS provides real-time visibility into shipment status, improving supply chain transparency (Mean =4.07, Std. dev=1.00).

Furthermore, the study results showed that the majority of respondents agreed that the TMS facilitates efficient communication with carriers and logistics partners (Mean=4.15, standard deviation=0.94). Additionally, the majority of respondents agreed that the TMS helps in managing freight costs and negotiating better rates with carriers (mean=3.94, standard deviation=1.05). Furthermore, the majority of respondents agreed that the TMS enables proactive exception management, allowing for faster response to delays or disruptions (mean=3.84, standard deviation =1.20. Lastly, the standard deviation and mean rating reveal that the respondents agreed that the TMS integrates seamlessly with existing manufacturing and warehouse management systems (mean=4.02, standard deviation=1.07). The results are presented in Table 4.8.

Table 4.8 Descriptive Statistics for Transportation Management System

Statements	Mean	Std. Dev
1. The TMS effectively tracks and manages inbound and outbound shipments.	3.95	1.193
2. The TMS optimizes transportation routes, leading to reduced delivery times and costs.	4.02	1.058
3. The TMS provides real-time visibility into shipment status, improving supply chain transparency.	4.07	1.000
4. The TMS facilitates efficient communication with carriers and logistics partners.	4.15	.937
5. The TMS helps in managing freight costs and negotiating better rates with carriers.	3.94	1.055
6. The TMS enables proactive exception management, allowing for faster response to delays or disruptions.	3.84	1.197
7. The TMS integrates seamlessly with existing manufacturing and warehouse management systems.	4.02	1.070

4.4.3 Descriptive Statistics for Automated Warehousing System

The researcher sought to determine the influence of automated warehousing systems on the supply chain performance of manufacturing firms in Uasin Gishu County, Kenya. A total of 7 statements were used and responses elicited on a 5-point Likert scale. The majority of the respondents agreed that automated warehousing systems significantly improve order fulfillment accuracy in manufacturing firms (Mean =4.02, Std. dev=1.23). The respondents also agreed that implementing an automated warehousing system leads to a reduction in labor costs for manufacturers (Mean =4.18, Std. dev=1.96). Consequently, the majority of the respondents agreed that integrating an automated warehousing system with a company's production planning software improves overall efficiency is (Mean, =4.17, Std. dev=1.02).

Analysis revealed that most of the respondents agreed that the initial investment cost of an automated warehousing system is a major barrier to adoption for many manufacturers (Mean, =3.99, Std. dev=1.09). Furthermore, the study results showed that quite a number of respondents agreed that the automated warehousing systems require a high level of technical expertise to operate and maintain (Mean=4.05, standard deviation=0.99). Additionally, the study results revealed that the majority of the respondents agreed that safety concerns regarding automated vehicles and machinery within a warehouse are a significant deterrent for some manufacturers (Mean=4.09, standard deviation=1.00). Finally, the respondent agreed that automated warehousing systems can help manufacturers adapt to fluctuations in demand more

effectively (Mean =4.19, Std. dev=0.98). The results are presented in Table 4.9.

Table 4.9 Descriptive Statistics for Automated Warehousing System

Statements	Mean	Std. Dev
1. Automated warehousing systems significantly improve order fulfillment accuracy in manufacturing firms.	4.02	1.226
2. Implementing an automated warehousing system leads to a reduction in labor costs for manufacturers.	4.18	.956
3. Integrating an automated warehousing system with a company's production planning software improves efficiency.	4.17	1.022
4. The initial investment cost of an automated warehousing system is a major barrier to adoption for many manufacturers.	3.99	1.089
5. Automated warehousing systems require a high level of technical expertise to operate and maintain.	4.05	.989
6. Safety concerns regarding automated vehicles and machinery within a warehouse are a significant deterrent for some manufacturers.	4.09	1.002
7. Automated warehousing systems can help manufacturers adapt to fluctuations in demand more effectively.	4.19	.975

4.5 Descriptive Statistics for Inventory Management System

The researcher sought to examine the influence of the inventory management system on the supply chain performance of manufacturing firms in Uasin Gishu County, Kenya. A total of 7 statements were used and responses elicited on a 5-point Likert scale.

The study findings showed that most of the respondents agreed that their inventory management system provides accurate real-time data on stock levels (Mean=4.06, Std. dev=1.17). Furthermore, the study's findings also revealed that a handful of the respondents agreed that the system effectively forecasts demand for raw materials and finished goods (mean=3.97, standard deviation=1.08). The study further revealed that the majority of respondents agreed that they can easily identify and eliminate obsolete or slow-moving inventory (Mean=4.08, standard deviation=1.03).

The study results showed that quite a number of the respondents agreed that the system minimizes stockouts and production delays (Mean=4.13, standard deviation=1.04). The study further revealed that the majority of the respondents agreed that their inventory management system helps us optimize storage space utilization (Mean=4.13, standard deviation=1.11). Similarly, the study results showed that the majority of the respondents agreed that the system allows for efficient order processing and reduces lead times (Mean=4.21, standard deviation=0.94). Also, the study findings noted that most of the respondents agreed that they can track inventory movement and identify potential shrinkage or theft (Mean=4.25, standard deviation=1.02). The results are presented in Table 4.10.

Table 4.10 Descriptive Statistics for Inventory Management System

Statements	Mean	Std. Dev
1. Our inventory management system provides accurate real-time data on stock levels.	4.05	1.170
2. The system effectively forecasts demand for raw materials and finished goods.	3.97	1.077
3. We can easily identify and eliminate obsolete or slow-moving inventory.	4.08	1.025
4. The system minimizes stock outs and production delays.	4.13	1.044
5. Our inventory management system helps us optimize storage space utilization.	4.13	1.108
6. The system allows for efficient order processing and reduces lead times.	4.21	.942
7. We can track inventory movement and identify potential shrinkage or theft.	4.25	1.023

4.5.1 Descriptive Statistics for Enterprise Resource Planning

The researcher sought to determine the influence of enterprise resource planning on the supply chain performance of manufacturing firms in Uasin Gishu County, Kenya. A total of 7 statements were used and responses elicited on a 5-point Likert scale. The study results showed that a good number of the respondents agreed that the implementation of an ERP system has significantly improved the efficiency of our production processes (Mean=3.97, standard deviation=1.22). Additionally, the study's findings demonstrated that the majority of the respondents agreed that the ERP system provides real-time data

on inventory levels, allowing for better production planning and reduced stockouts (Mean=4.23, standard deviation=0.94).

Also, the study's findings demonstrated that majority of the respondents agreed that the integration of all departments (e.g., production, sales, finance) through the ERP system has enhanced communication and collaboration (Mean=4.14, standard deviation=1.10). Further, the study's findings demonstrated that majority of the respondents agreed that the reporting capabilities of the ERP system allow for better decision-making by providing insightful data on production costs, performance metrics, and sales trends (Mean=4.09, standard deviation=1.02).

Moreover, most of the respondents agreed that the user interface of the ERP system is user-friendly and easy to navigate for employees across all departments (Mean=4.00, standard deviation=1.11). Similarly, the majority of the respondents agreed that the training provided for employees on how to use the ERP system was adequate and prepared them for its successful adoption (Mean=4.10, standard deviation=1.11). Finally, findings demonstrated that the majority of the respondents agreed that the implementation of the ERP system has led to a significant reduction in errors and improved data accuracy across the manufacturing process (Mean=4.24, standard deviation=0.97). The results are presented in Table 4.11.

Table 4.11 Descriptive Statistics for Enterprise Resource Planning

Statements	Mean	Std.
1. The implementation of an ERP system has significantly improved the efficiency of our production processes.	3.97	1.221
2. The ERP system provides real-time data on inventory levels, allowing for better production planning and reduced stockouts.	4.23	.938
3. The integration of all departments (e.g., production, sales, and finance) through the ERP system has enhanced communication and collaboration.	4.14	1.103
4. The reporting capabilities of the ERP system allow for better decision-making by providing insightful data on production costs, performance metrics, and sales trends.	4.09	1.016
5. The user interface of the ERP system is user-friendly and easy to navigate for employees across all departments.	4.00	1.112
6. The training provided for employees on how to use the ERP system was adequate and prepared them for its successful adoption.	4.10	1.113
7. The implementation of the ERP system has led to a significant reduction in errors and improved data accuracy across the manufacturing process.	4.24	.968

4.5.2 Descriptive Statistics for Supply Chain Performance

The researcher sought to determine the supply chain performance of manufacturing firms in Uasin Gishu County Kenya. A total of 7 statements were used and responses elicited on a 5-point Likert scale. The study results showed that least but above average of the respondents agreed that their suppliers consistently deliver materials on time and in full (Mean=3.95, Std. dev=1.26).

Further, the study's findings revealed that the majority of the respondents agreed (mean=4.08, standard deviation=1.11) that their manufacturing process experiences minimal disruptions due to supply chain issues. Additionally, the study results revealed that the majority of the respondents agreed that they are able to quickly adapt their production plans to changes in customer demand (Mean=4.05, standard deviation=1.05).

Furthermore, respondents also agreed that they have good visibility into inventory levels across their entire supply chain, as shown by Mean=4.11, standard deviation=1.10. Study results further showed that the majority of the respondents agreed that their finished products are delivered to customers on time and within budget (mean=4.16, standard deviation=1.05). Similarly, the study findings showed the majority of the respondents agreed with the statement that they can negotiate favorable prices with their suppliers (Mean=4.31, Std. dev=0.91). Finally, most of the respondents agreed that they have strong communication and collaboration with their supply chain partners is, (Mean=4.30, Std. dev=1.06). The results are presented in Table 4.12.

Table 4.12 Descriptive Statistics for Supply Chain Performance

Statements	Mean	Std. Dev
1. Our suppliers consistently deliver materials on time and in full.	3.95	1.264
2. Our manufacturing process experiences minimal disruptions due to supply chain issues.	4.08	1.109
3. We are able to quickly adapt our production plans to changes in customer demand.	4.05	1.053
4. We have good visibility into inventory levels across our entire supply chain.	4.11	1.104
5. Our finished products are delivered to customers on time and within budget.	4.16	1.047
6. We are able to negotiate favorable prices with our	4.31	.910
7. We have strong communication and collaboration with our supply chain partners.	4.30	1.058

4.4 Reliability Test Results

Results of the reliability test revealed that all the study variables had a Cronbach's Alpha between 0.882 and 0.915, which is within the acceptable range of 0.7. The study findings in Table 4.13 revealed that Cronbach's Alpha for the electronic order processing system is .871, which indicates an acceptable level of reliability. This means that the 7 items used to measure the electronic order processing system are consistently measuring the same underlying construct. Cronbach's Alpha for the transportation management system is .901, suggesting a good level of reliability. The 7 items used to measure transportation management systems consistently assess the same concept. With a Cronbach's Alpha of .882, the automated warehousing system has a good level of reliability.

The 7 items used to measure this variable consistently measure the same underlying concept. The Cronbach's Alpha for the inventory management system is .908, indicating a good level of reliability. The 7 items used to measure the inventory management system consistently assess the same concept. With Cronbach's Alpha of .892, enterprise resource planning has a good level of reliability. The 7 items used to measure this variable consistently measure the same underlying concept.

The Cronbach's Alpha for financial performance is .915, suggesting an acceptable level of reliability. The 7 items used to measure supply chain performance of manufacturing firms consistently assess the same concept. This implies that all variables hve Cronbach's Alpha values above .70, which is generally considered an acceptable level of reliability. Finally, the overall Cronbach's Alpha score for the measuring instrument with 42 items indicated a score of .974, far above the accepted score of 0.7, thus the instrument was reliable for the study. The results are presented in Table 4.13.

Table 4.13 Reliability Test

Variables	Number of Items	Cronbach's
Electronic order processing system	7	.871
Transportation management system	7	.901
Automated warehousing system	7	.882
Inventory management system	7	.908
Enterprise resource planning	7	.892
Supply chain performance	7	.915
Total Instrument Score	42	.974

4.5 Validity Test Results

The study used factor analysis to test for validity of the research instruments

4.5.1 Factor Analysis for Supply Chain Performance of Manufacturing Firms

Principal Component Analysis was carried out to verify the validity of seven items proposed to measure the supply chain performance of manufacturing firms. The KMO value of the analysis was 0.910, indicating that sampling was adequate. The significant Chi-square value for Bartlett's test of sphericity (χ^2 = 1060.070, $p<0.05$) confirmed that the data collected for supply chain performance of manufacturing firms was adequate. The seven-supply chain performance of manufacturing firms' statements explained cumulatively 66.624% of the variance in supply chain performance. Varimax rotation was done, and 7 statements were loaded on only one component, with an initial eigenvalue of 4.664, which is above 1.0; thus, none of the items were deleted, and all seven statements were retained, computed, and renamed supply chain performance for further analysis (Table 4.14).

Table 4.14 Rotational Component Matrix for Supply Chain Performance

Name of items	Component 1
Our suppliers consistently deliver materials on time and in full.	.882
Our manufacturing process experiences minimal disruptions due to supply chain issues.	.819
We are able to quickly adapt our production plans to changes in customer demand.	.828
We have good visibility into inventory levels across our entire supply chain.	.755
Our finished products are delivered to customers on time and within budget.	.782
We are able to negotiate favorable prices with our suppliers.	.812
We have strong communication and collaboration with our supply chain partners.	.830
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.910
Bartlett's Test of Sphericity Approx. Chi-Square	1060.070
df	21
Sig.	.000
Initial Eigenvalues	4.664
Total Variance Explained	66.624

4.5.2 Factor Analysis for Electronic Order Processing System

The seven items proposed to measure the electronic order processing system were also factor analyzed. The KMO value of the electronic order processing system was 0.869, indicating that sampling was adequate. The significant chi-square value for Bartlett's test of sphericity ($\chi^2 = 728.176$, $p<0.05$) confirmed that the data collected for the electronic order processing system were adequate. The seven statements measuring this variable explained cumulatively 56.516% of the variance in the electronic order processing system. Varimax rotation was done, and thus the rotated component matrix for the electronic order processing system indicators was run, and 7 statements were loaded into only one component. Results show that none of the items were deleted, and all seven statements were retained and were used to compute

the variable electronic order processing system for further analysis (Table 4.15).

Table 4.15 Factor Analysis for Electronic Order Processing System

Name of Items	Component 1
The electronic order processing system in our firm allows for quick and accurate order entry.	.818
The system provides real-time inventory visibility, enabling efficient production planning.	.773
The electronic order processing system has improved communication and collaboration between departments (sales, production, and inventory).	.756
The system automates order processing tasks, reducing manual errors and processing time.	.763
The electronic order processing system has increased customer satisfaction by providing faster order fulfillment.	.691
The system offers easy access to order history and tracking information for both internal and external stakeholders.	.732
Our electronic order processing system integrates seamlessly with other enterprise resource planning (ERP) systems within the company.	.722
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.869
Bartlett's Test of Sphericity Approx. Chi-Square	728.176
df	21
Sig.	.000
Initial Eigenvalues	3.956
Total Variance Explained	56.516

4.5.3 Factor Analysis for Transportation Management System

Principal Component Analysis was further conducted to verify the validity of the seven items proposed to measure the transportation management system. The KMO value of this analysis was 0.894, indicating that sampling was adequate. The significant chi-square value for Bartlett's test of sphericity (χ^2 = 964.251, $p<0.05$) confirmed that the data collected for the transportation

management system were adequate. Varimax rotation was done, and the rotated component matrix for transportation management system indicators was run, and 7 statements were loaded on one component with an initial eigenvalue of 4.433. The seven transportation management system statements explained cumulatively 63.325% of the variance in the transport management system. None of the statements were deleted, and all were retained, computed, and renamed the transportation management system for further analysis (Table 4.16).

Table 4.16 Factor Analysis for Transportation Management System

Name of Items	Component 1
The TMS effectively tracks and manages inbound and outbound shipments.	.841
The TMS optimizes transportation routes, leading to reduced delivery times and costs.	.856
The TMS provides real-time visibility into shipment status, improving supply chain transparency.	.824
The TMS facilitates efficient communication with carriers and logistics partners.	.765
The TMS helps in managing freight costs and negotiating better rates with carriers.	.744
The TMS enables proactive exception management, allowing for faster response to delays or disruptions.	.727
The TMS integrates seamlessly with existing manufacturing and warehouse management systems.	.805
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.894
Bartlett's Test of Sphericity Approx. Chi-Square	964.251
df	21
Sig.	.000
Initial Eigenvalues	4.433
Cumulative % Total Variance Explained	63.325

4.5.4 Factor Analysis for Automated Warehousing System

To verify the validity of the seven items proposed to measure the automated warehousing system, Principal Component Analysis was carried out. The KMO value of the automated warehousing system was 0.877, indicating that the sample size was adequate. The significant chi-square value for Bartlett's test of sphericity (χ^2 = 806.375, $p<0.05$) confirmed that the data collected for the automated warehousing system were adequate. Varimax rotation was done, and thus the rotated component matrix for the automated warehousing system indicators was run, and 7 statements was loaded on one component with an initial eigenvalue of 4.136. The seven automated warehousing system statements explained cumulatively 59.089% of the variance in rotation sums of squared components associated with the automated warehousing system. None of the statements was deleted as all were retained, computed, and renamed automated warehousing system term for further analysis (Table 4.17).

Table 4.17 Rotational Component Matrix[a] for Automated Warehousing System

Name of Items	Component 1
The TMS effectively tracks and manages inbound and outbound shipments.	.841
The TMS optimizes transportation routes, leading to reduced delivery times and costs.	.856
The TMS provides real-time visibility into shipment status, improving supply chain transparency.	.824

The TMS facilitates efficient communication with carriers and logistics partners.	.765
The TMS helps in managing freight costs and negotiating better rates with carriers.	.744
The TMS enables proactive exception management, allowing for faster response to delays or disruptions.	.727
The TMS integrates seamlessly with existing manufacturing and warehouse management systems.	.805
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.877
Bartlett's Test of Sphericity Approx. Chi-Square	806.375
df	21
Sig.	.000
Initial Eigenvalues	4.136
Cumulative % of the Total Variance Explained	59.089

4.5.5 Factor Analysis for Inventory Management System

To verify if the seven items proposed to measure inventory management system, the study factor analyzed them. Results revealed a KMO value of 0. 902.The significant chi-square value for Bartlett's test of sphericity (χ^2 = 967.918, $p<0.05$) confirmed that data collected for inventory management system was adequate. Varimax rotation was done and thus rotated component matrix for inventory management system indicators was run and 7 items loaded on only one component with the items explaining a cumulatively 64.514% of the variance in rotation sums of squared components associated with inventory management system having an initial Eigenvalues of 4.516. None of the statements was deleted as all were retained, computed and renamed inventory management system for further analysis (Table 4.18).

Table 4.18 Rotational Component Matrix[a] for inventory management system

Name of items	Component 1
Our inventory management system provides accurate real-time data on stock levels.	.849
The system effectively forecasts demand for raw materials and finished goods.	.821
We can easily identify and eliminate obsolete or slow-moving inventory.	.821
The system minimizes stockouts and production delays.	.816
Our inventory management system helps us optimize storage space utilization.	.779
The system allows for efficient order processing and reduces lead times.	.768
We can track inventory movement and identify potential shrinkage or theft.	.766
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.902
Bartlett's Test of Sphericity Approx. Chi-Square	967.918
df	21
Sig.	.000
Initial Eigenvalues	4.516
Total Cumulative % Variance Explained	64.514

4.5.6 Factor Analysis for Enterprise Resource Planning

Principle Component Analysis was carried out to determine the validity of the seven items meant to measure enterprise resource planning. Findings indicated a KMO value 0.907 with a significant Chi-square value for Bartlett's test of sphericity (χ^2 = 841.920, p<0.05) which confirmed the sample size adequacy. Varimax rotation was done and thus rotated component matrix for enterprise resource planning indicators was run and 7 statements were loaded on one component with initial Eigenvalues of 4.266.

The seven statements explained cumulatively 60.939% of the variance in enterprise resource planning. All the statements were retained, computed and renamed enterprise resource planning (Table 4.19).

Table 4.19 Rotational Component Matrix[a] for Enterprise Resource Planning

Name of Items	Component 1
The implementation of an ERP system has significantly improved the efficiency of our production processes.	.864
The ERP system provides real-time data on inventory levels, allowing for better production planning and reduced stockouts.	.756
The integration of all departments (e.g., production, sales, finance) through the ERP system has enhanced communication and collaboration.	.807
The reporting capabilities of the ERP system allow for better decision-making by providing insightful data on production costs, performance metrics, and sales trends.	.789
The user interface of the ERP system is user-friendly and easy to navigate for employees across all departments.	.736
The training provided for employees on how to use the ERP system was adequate and prepared them for its successful adoption.	.723
The implementation of the ERP system has led to a significant reduction in errors and improved data accuracy across the manufacturing process.	.780
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.907
Bartlett's Test of Sphericity Approx. Chi-Square	841.920
df	21
Sig.	.000
Initial Eigenvalues	4.266
Total Cumulative % Variance Explained	60.939

4.6 Multiple Regression Assumptions Test

Multiple regression assumptions were tested prior to conducting a regression model. The assumptions of regression that were tested in this study include, multicollinearity, normality, linearity and data independence/ autocorrelation

4.6.1 Multicollinearity Assumption Test

Multicollinearity refers to the assumption that the independent variables are uncorrelated (Winship & Western, 2016). The multicollinearity test assumption was tested using tolerance and Variance Inflation Factor (VIF). The study results indicated that electronic order processing system had a tolerance of 0.308 and VIF of 3.248. The transportation management system had a tolerance of 0.515 and VIF of 2.408. Automated warehousing system had a tolerance of 0.347 and VIF of 2.883. Inventory management system had a tolerance of 0.407 and VIF of 2.459 and lastly Enterprise resource planning had a tolerance of 0.835 and VIF of 1.198. This implies that the data had low Multicollinearity. The tolerance of below 0.10 or a VIF greater than 10 indicated serious Multicollinearity problems. The test assumption was presented in Table 4.20.

Table 4.20 Multicollinearity Test Assumption

Variables	Tolerance	VIF
Electronic order processing system	.308	3.248
Transportation management system	.415	2.408
Automated warehousing system	.347	2.883
Inventory management system	.407	2.459
Enterprise resource planning	.835	1.198

4.6.2 Normality Assumption Test

The normality assumption test was tested using histogram. The histogram appears to be approximately bell-shaped, suggesting a normal distribution. The distribution is roughly symmetric around the mean, indicating that the residuals are evenly distributed on both sides of the mean. There are no obvious outliers or extreme values that would significantly deviate from the expected pattern of a normal distribution. The mean of the residuals is very close to zero (-1.66E-15), which is expected for standardized residuals. The standard deviation is 0.990, indicating that the residuals are relatively well-distributed around the mean as provided in Figure 4.1.

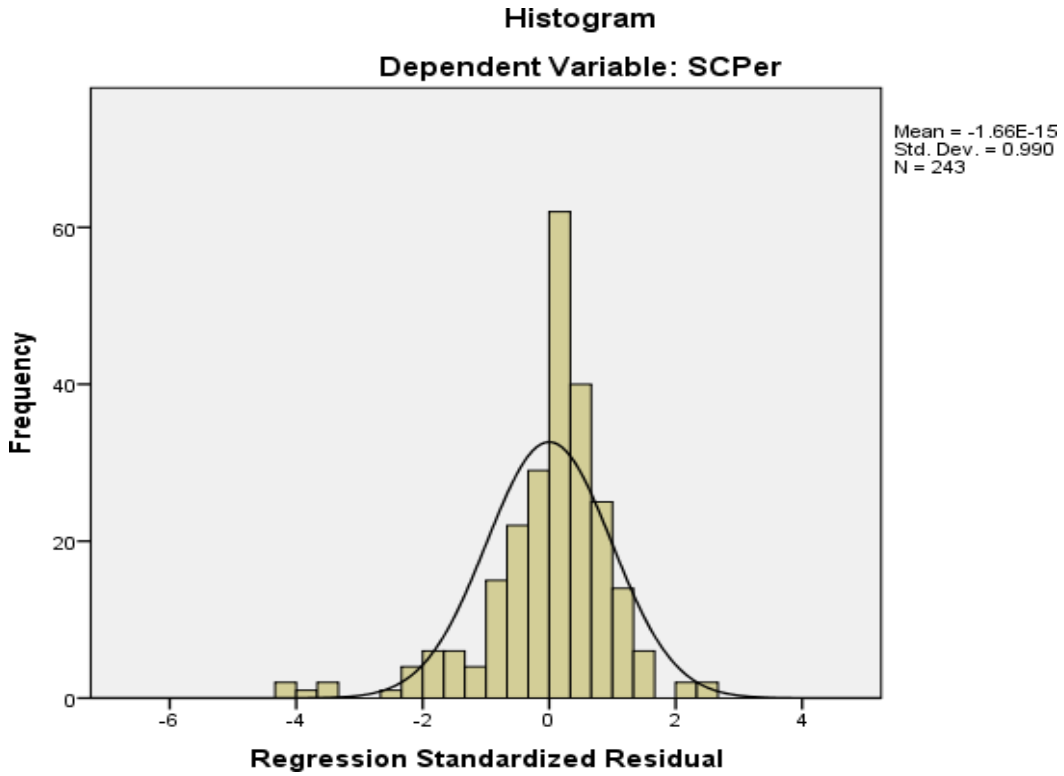

Figure 4.1 Histogram

In addition, Skewness and kurtosis showed a normal distribution of the data, with skewness values ranging from -1.352 to -1.023 while Kurtosis values ranged from 1.328 to 0.095, which is within an acceptable margin of ±3. This implies that the normality assumption has not been violated in the study. Skewness and Kurtosis results are presented in Table 4.21.

Table 4.21 Skewness and Kurtosis for Testing Normality Assumption

Variables	Skewness	Kurtosis
Supply chain performance	-1.061	.095
Electronic order processing system	-1.053	.654
Transportation management system	-1.090	.593
Automated warehousing management system	-1.023	.707
Inventory management system	-1.352	1.328
Electronic resource planning	-1.093	.187

4.6.3 Linearity Assumption Test

A correlation analysis was performed to determine the linearity between the study variables and the dependent variable. Results showed that all the variables were linearly related to the outcome variable at a 0.01 significance level, with the electronic order processing system having the strongest score of 0.686 and electronic resource planning having the least, with a score of 0.398. Based on the outcome of the analysis, we conclude that the assumption of linearity has not been violated in the study, as shown in Table 4.22.

Table 4.22 Linearity Results

Variables	Correlation	Sig.
Supply chain performance	1	-
Electronic order processing system	.686**	.01
Transportation management system	.641**	.01
Automated warehousing management system	.659**	.01
Inventory management system	.652**	.01
Electronic resource planning	.398**	.01

Correlation is significant at the 0.01 level (2-tailed).

4.6.4 Testing Assumption Homoscedasticity

The assumption of homoscedasticity (which means "same variance") is fundamental to linear regression models. It refers to a scenario where the error term (also known as "noise" or random disturbance in the relationship between the independent variables and the dependent variable) is constant across all independent variable values. According to Đalić and Terzić (2021), residual variance should remain constant across all levels of independent variables in relation to the dependent variable. This study used scatterplots to investigate the error term's constant variance. Figure 4.2 shows that the standardized residual values quoted against the standardized predicted values are distributed around zero with a few cases of deviation, indicating that the homoscedasticity assumption has been met. The points are not clustered in any particular areas of the plot, indicating that there is no evidence of heteroscedasticity (unequal variance of residuals). Based on these observations, the scatterplot suggests that the assumption of homoscedasticity is reasonably met in the regression model.

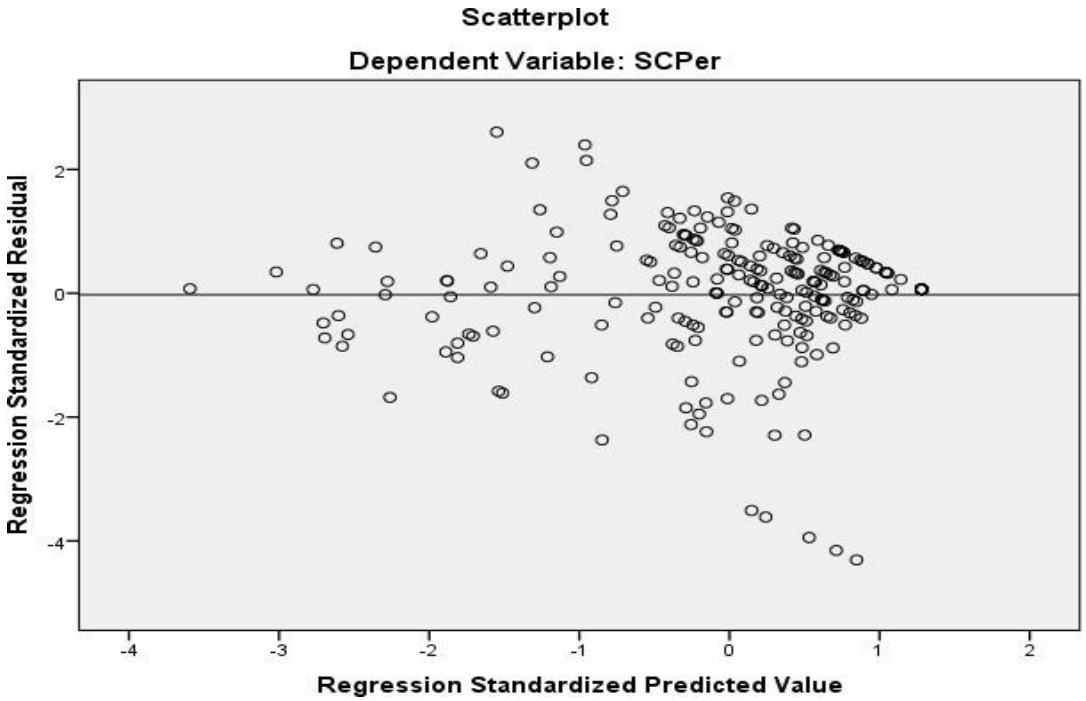

Figure 4.2 Scatterplot

4.6.5 Testing for Autocorrelation Assumption

Research assumes that one must have a set of independent findings that ensure that the value of one observation has no effect on the value of the others. Non-independent observations can cause the statistical test to produce an excessive number of false positive predictions; therefore, errors are assumed to be independent. According to Garson (2012), the Durbin-Watson coefficient, based on studentized residuals, can be used to test independence. For independent observations, the Durbin-Watson statistic should range from 1.5 to 2.5. Table 4.23 revealed that the Durbin-Watson score is 1.737, which is within the limit, hence confirming that there is no violation of the assumption of autocorrelation in this study.

Table 4.23 Data Independence

Model	R	R Square	Adjusted R Square	Std. Error of Estimate	Durbin-Watson
1	.756	.572	.563	.61635	1.737

4.7 Correlation Analysis Results

Before testing the study hypotheses, the study used the correlation analysis to test for the direction and strength of the relationship between independent variables and dependent variable. The correlation results revealed that electronic order processing system has the strongest, positive and significant relationship with supply chain performance as indicated by r = 0.686, p = 0.01. This is followed by automated warehousing system and inventory management system with scores of r = 0.659, .652 respectively with both being positive and significantly related to supply chain performance at p = 0.01. Transportation management system (r=.641, p=.01) and enterprise resource planning (r = 0.398, p = 0.01) have the least significant relationship with supply chain performance. This implies that all the study variables were positively and significantly related to supply chain performance of manufacturing firms. The results are presented in Table 4.24

Table 4.24 Correlation Analysis Results

Variable (n=243)	1	2	3	4	5	6
Supply chain performance	1					
Electronic order processing system	.686**	1				
Transportation management system	.641**	.711**	1			
Automated warehousing management	.659**	.768**	.679**	1		
Inventory management system	.652**	.710**	.670**	.700**	1	
Electronic Resource Planning	.398**	.391**	.342**	.305**	.337**	1

**. Correlation is sig. at the 0.01 level (2-tailed).

4.8 Hypotheses Testing

The study tested five direct and four moderation hypotheses as per the objectives presented in chapter one of this document. However, before testing these hypotheses, it was worth confirming if the two control variables, firm age and firm size, influence supply chain performance and the amount of variance they explain in this dependent variable.

4.8.1 Results for Control Variables

A hierarchical regression model was used in testing all the hypotheses, beginning with the effects of the controls. Model 1 of the Table shows results for the control variables. Findings indicate that firm age significantly and positively influences supply chain performance in manufacturing firms, as indicated by β=0.190. However, results show that firm size was found to be insignificant, β= 0.101, p= 223. Model 1 further reveals that the two control

variables explain 4.8% of the variance in supply chain performance, as shown by R^2= 0.048, F-statistics = 6.045, which was significant at p=0.000, indicating the model Fit. Table 4.25 presents the results of this analysis.

4.8.2 Testing the Direct Effects -Hypotheses H_{01}, H_{02}, H_{03} and H_{04}

Model 2 presents the results of H01-H04 while controlling for firm age and firm size. Results show that both the controls were insignificant in this model as shown by p >.05. This Model reveals an improved R^2 = 0.566 implying that all the variables in this model (Firm age, firm size, electronic order processing system, transportation management system, automated warehousing management system and inventory management systems cumulatively explain 56.6% of the variance in supply chain performance. The change in R-Square (ΔR^2) = 0.518, implies that when control variables are held constant, the four independent variables account for 51.8% of the variance in supply chain performance. Results further show that the model was fit as shown by F=70.386, which was significant at p= 0,000. In addition, findings reveal that electronic order processing system β= 0.316, p= 0.001, transport management system β= 0.167, p= 0.011, automated warehousing system β= 0.217, p= 0.008 and inventory management systems β= 0.232, p = 0.001 all positively and significantly influences supply chain performance of manufacturing firms in Uasin Gishu County Kenya, hence hypotheses H_{01}, H_{02}, H_{03} and H_{04} are all rejected. Table 4.25 presents the results of this analysis.

4.8.3 The Influence of Electronic Resource Planning on Supply Chain Performance indicated as Hypothesis H_{05}

The study examined the direct influence of moderating electronic resource planning on supply chain performance while keeping controls and independent variables constant. Model 3, showed a significant model fit with F-statistics = 6.689, p = 0.010. Results further reveal a much better R^2 = 0.578, indicating that all the variables in this Model 3 explain 57.8% of the variance in supply chain performance. In addition, results show ΔR^2 = 0.012, implying that when the controls and the independent variables are held constant, the moderator variable, electronic resource planning, contributes to 1.2% of the variance in supply chain performance. Further, findings show that all the independent variables remained significant in this model as shown by p<.05. Most importantly, electronic resource planning was found to have a direct, positive and significant influence on supply chain performance, as indicated by β = 0.094, p = 0.010. Based on these results, hypothesis H05 is hereby rejected, and the conclusion made that electronic resource planning positively influences the supply chain performance of manufacturing firms. Table 4.25 presents the results of this analysis.

4.8.4 The Moderating Influence of Electronic Resource Planning on the Relationship between Electronic Order Processing System and Supply Chain Performance (Hypothesis H06a)

Model 4 presents the results of Hypothesis H06a, which stated that enterprise resource planning has no moderating influence on the relationship between electronic order processing system and supply chain performance of

manufacturing firms in Uasin Gishu County. Findings show that both the control variables, electronic order processing system, transportation management system, and electronic resources planning were all insignificant in this Model as indicated by p >.05. However, automation warehousing system (β = 0.172, p = 0.027) and inventory management system (β = 0.173, p = 0.011) remained significant. Results further showed that enterprise resource planning has a moderating influence on the relationship between electronic order processing system and supply chain performance of manufacturing firms (β = 0.100, p = 0.000. This Model shows R^2 = 0.620 indicating that all the variables in this model explains 62% of the variance in supply chain performance. The change in R^2 of 0.042 implies that when all the variables are held constant, the moderation term contributes 4.2% of the variance in supply chain performance of the manufacturing firms. Based on the above results the null hypothesis was rejected and the conclusion was made that enterprise resource planning moderates the link between electronic order processing system and supply chain performance of manufacturing firms. Table 4.25 presents the results of this analysis.

These results are further illustrated by **Fig. 4.3**, which shows that supply chain performance increases when a firm adopts both electronic order processing systems and electronic resource planning in its operations, as it increases effectiveness and efficiency. However, supply chain performance reduces gradually with less adoption of both electronic order processing systems and electronic resource planning. Electronic resource planning acts as a solution of

low electronic order processing system in the supply chain management of the manufacturing firms.

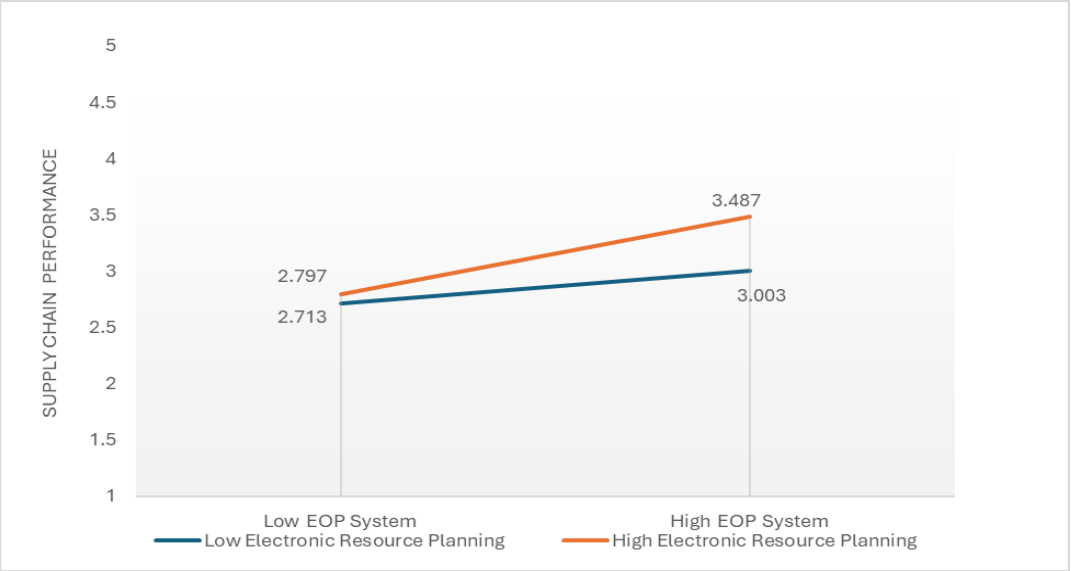

Figure 4.3 Graphical Presentation of the moderating influence of ERP on EOP and Supply Chain Performance.

4.8.5 The Moderating Influence of Electronic Resource Planning on the Relationship between Transportation Management System and Supply Chain Performance (Hypothesis $H0_{6b)}$

In model 5 moderating influence of electronic resource planning and transportation management system was tested. In this analysis, findings show that the control variables, electronic order processing system, transportation management system, inventory management system and enterprise resource planning were found to be insignificant as automated warehousing system reman significant as shown by $p<.05$. This model indicates a model fit of F-statistics = 6.423, which was significant at $p= 0.012$. Findings further indicate an improved $R^2 = 0.630$, implying that the variable in this model accounts for 63% of the variance in supply chain performance. The change in R^2 of 0.010

shows that the interaction term explains 1% of the variance in supply chain performance. Most importantly findings reveal that electronic resource planning moderates the relationship between transportation management system and supply chain performance as shown by β= 0.054, p= 0.012. Based on the above findings, H6b is also rejected by the study.

The results of this moderation model are further explained by Fig. 4.4 which shows at low levels of both transportation management system and electronic resource planning, supply chain is at the same level. However, as firms embrace both systems, supply chain performance tend to improve as shown from the graph from 2.9 point to 3.113 points.

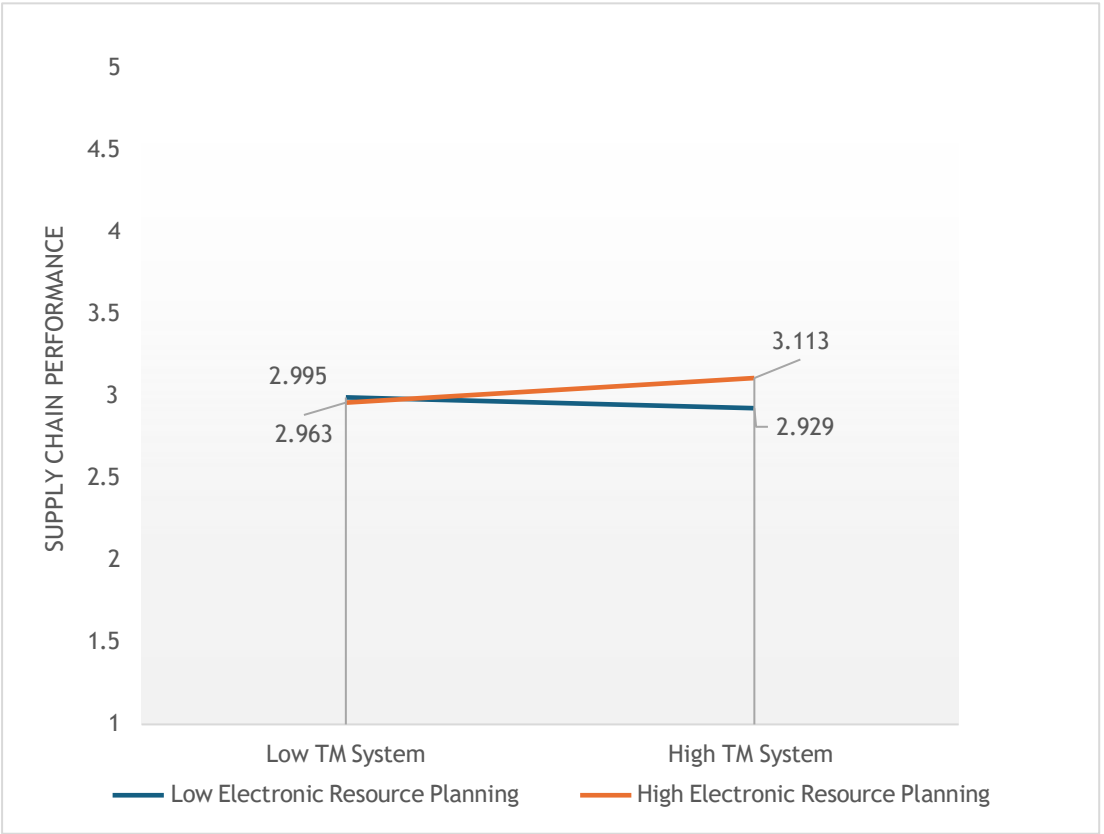

Figure 4.4 Graphical Presentation of the moderating influence of ERP on TMS and Supply Chain Performance.

4.8.6 The Moderating Influence of Electronic Resource Planning on the Relationship between Transportation Management System and Supply Chain Performance (Hypothesis H06c)

Model 6, examined the moderating influence of electronic resource planning on the link between automated warehousing systems and supply chain performance. Results of the model fit indicate F = 0.148, which was insignificant at p = 0.701. Additionally, this model explains 63.1% (R2 = 0.631) of the variance in supply chain performance, but the interaction term does not contribute anything to supply chain performance, as shown by the zero change in R2. Results further show that all the variables in this model were found to be insignificant, as shown by p >.05. In addition, the results of the moderation term show (β = -013, p = 0.701. Since the p>.05, we fail to reject this hypothesis and conclude that electronic resource planning does not moderate the relationship between automation warehousing systems and supply chain performance.

4.8.7 The Moderating Influence of Electronic Resource Planning on the Relationship between Inventory Management System and Supply Chain Performance (Hypothesis H06d)

The last model, Model 7, examined the moderating influence of electronic resource planning on the association between inventory management systems and supply chain performance while holding constant the rest of all the other variables. Findings indicate that both the control variables, transportation management system, automation management system, and electronic resource planning were all insignificant, while electronic order system and inventory

management system were significant in this model. Results show that this model 7 has an F-statistic of 9.385, which was significant at p = 0.002. In addition, results show that the model has the highest R^2 of 0.645, suggesting that all the variables in this model explain 64.5% of the variance in supply chain performance. The ΔR^2 = 0.014 implies that the moderation process explains 1.4% of the variance in supply chain performance of the manufacturing firms in Uasin Gishu County. Most importantly, the moderation process of electronic resource planning on the link between inventory management systems and supply chain performance indicates β = -0.120, p = 0.002. Because the p-value is less than 0.05, hypothesis H06d was rejected by the study.

The results of this interaction are explained by Figure 4.5, which reveals that at a low level of inventory management adoption process, supply chain performance with firms is higher in firms that embraces electronic resource planning than firms that does not adopt it. However, as firms embrace more inventory management systems, supply chain performance increases in both scenarios of embracing electronic resource planning, but it’s much higher in firms that initially didn’t embrace it.

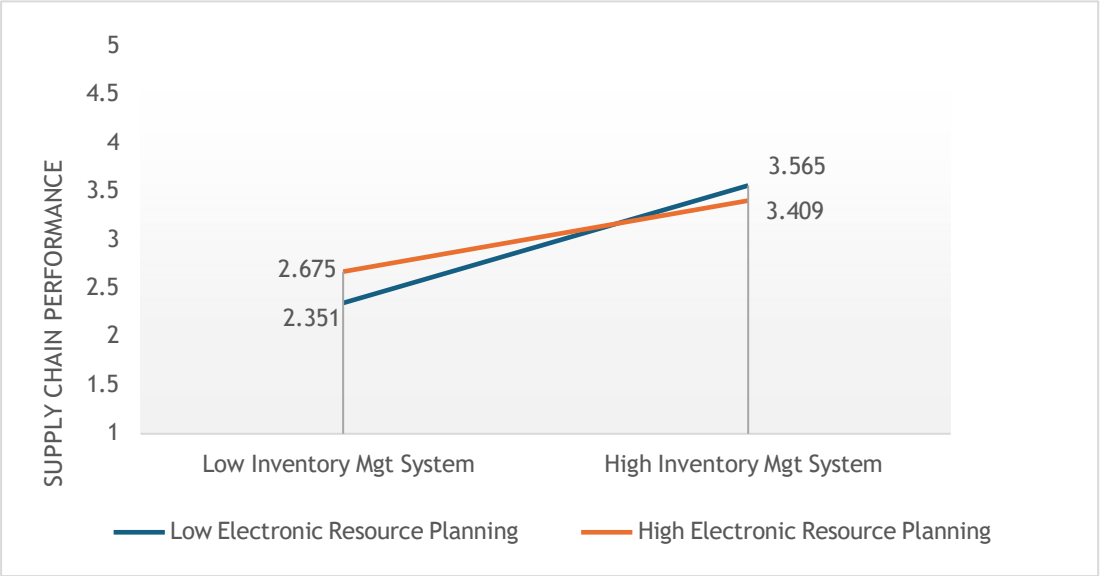

Figure 4.5 Graphical Presentation of the moderating influence of ERP on IMS and supply chain performance.

Table 4.25 Results of the Hierarchical Regression Model

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7	
	β	p-v	β	p-v	β	p-v	β	p-v		p-v	β	p-v	β	p-v
Firm Age	.190*	.021	.102	.074	.089	.117	.034	.533	.047	.391	.046	.401	.063	.241
Firm Size	.101	.223	-.089	.125	-.090	.116	-.057	.295	-.057	.295	-.055	.308	-.074	.169
EOP			.316***	.001	.278**	.003	-.245	.073	-.102	.483	-.147	.432	-.539	.017
TMS			.167*	.011	.157*	.016	.104	.098	.021	.767	.021	.764	.013	.852
AWS			.217**	.008	.222**	.006	.172*	.027	.163	.034	.203	.119	.246	.057
IMS			.232***	.001	.218**	.002	.173*	.011	.134	.051	.132	.055	.487***	.000
ERP					.094**	.010	.042	.250	.038	.287	.040	.271	.042	.237
EOP_ERP							.100***	.000	.047	.099	.060	.171	.168**	.003
TMS_ERP									.054*	.012	.055*	.011	.066**	.002
AWS_ER											-.013	.701	-.013	.699
IMS_ERP													-.120**	.002
R^2	.048		.566		.578		.620		.630		.631		.645	
ΔR^2	.048		.518		.012		.042		.010		.000		.014	
F	6.045**		70.386***		6.689**		26.021***		6.423*		.148		9.385**	

Source: Research data (2024). Dependent variable: Supply chain performance: Note: significant $^{*}p\leq.05$; $^{**}p\leq.01$; $^{***}p\leq.001$, EOP=Electronic Order Processing System, TMS= Transport Management System, AWS= Automation Warehousing System IMS= Inventory Management Systems, ERP=Electronic Resource Planning, EOP_ERP= 1^{ST} Moderation of ERP on the relationship EOP and Supply chain performance, TMS_ERP= 2^{ND} Moderation of ERP on the relationship TMS and Supply chain performance, AWS_ERP= 3^{RD} Moderation of ERP on the relationship AWS and Supply chain performance, IMS_ERP= 4^{TH} Moderation of ERP on the relationship IMS and Supply chain performance,

Table 4.26 Summary of Hypotheses Test Results

Hypotheses	β-value	p-value	Decision rule
H_{01}. Electronic order processing system has no significant influence on supply chain performance of manufacturing firms	β_1 = .316	p=0.001<0.05	Rejected the null hypothesis
H_{02}. Transport management system has no significant influence on supply chain performance of manufacturing firms	β_2 = .167	p=0.011<0.05	Rejected the null hypothesis
H_{03}.Automated warehouse system has no significant influence on supply chain performance of manufacturing firms	β_3 = .217	p=0.008<0.05	Rejected the null hypothesis
H_{04}.Inventory management system has no significant influence on supply chain performance of manufacturing firms.	β_4 = .232	p=0.001<0.05	Rejected the null hypothesis
H_{05}. Enterprise resource planning has no significant influence on supply chain performance of manufacturing firms	β_{5a} =.094	p=0.010<0.05	Rejected the null hypothesis
H_{06a}. Enterprise resource planning has no moderating influence on the relationship between electronic order processing system and supply chain performance of manufacturing firms	β_{5a} =.100	p=0.000<0.05	Rejected the null hypothesis
H_{06b}.Enterprise resource planning has no moderating influence on the relationship between transport management system and supply chain performance of manufacturing firms	β_{5b}=.054	p=0.012<0.05	Rejected the null hypothesis
H_{06c}.Enterprise resource planning has no moderating influence on the relationship between Automated warehouse system and supply chain performance of manufacturing firms	β_{5c}= -.013	p=0.701>0.05	Failed to reject the null hypothesis
H_{06d}.Enterprise resource planning has no moderating effect on the relationship between Inventory management system and supply chain performance of manufacturing firms	β_{5d}=-.120	p=0.002<0.05	Rejected the null hypothesis

CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1 Overview

Summary of the findings, conclusions, and recommendations was presented in this chapter. Conclusions and recommendations made addressed the research objectives.

5.2 Summary of the Study Findings

The general objective of this study was to examine the moderating influence of Electronic Resource Planning on the relationship between E-logistics and Supply Chain Performance of manufacturing firms, in Uasin Gishu County, Kenya. E-logistic had four constructs (electronic order processing system, transportation management system, automated warehousing system, and inventory management system) that were directly linked to the outcome variable (supply chain performance) then the moderator (Enterprise Resource planning) was introduced in the relationship between predictor variables and dependent variables. Before testing the hypotheses, the researcher examined the influence of the covariates on the outcome variable.

The study finding revealed that firm age positively influences supply chain performance (β=0.190, p=0.021), while firm size was found to be insignificant (β=0.101, p=0.223). Together, these variables explain 4.8% of the variance in supply chain performance. The analysis revealed that electronic order processing systems, transportation management systems, automated warehousing management systems, and inventory management systems significantly enhance supply chain performance, with a combined R^2 of 0.566.

The change in R^2 (ΔR^2=0.518) indicates these factors account for 51.8% of the variance when controlling for firm age and size.

ERP was found to have a direct positive influence on supply chain performance (β=0.094, p=0.010), contributing an additional 1.2% to the variance (ΔR^2=0.012). ERP moderates the relationship between electronic order processing systems and supply chain performance (β=0.100, p=0.000), with a model R^2 of 0.620. ERP also moderates the relationship between transportation management systems and supply chain performance (β=0.054, p=0.012), with an R^2 of 0.630. No moderating effect was found (β=-0.013, p=0.701), indicating ERP does not influence this relationship. ERP moderates the relationship between inventory management systems and supply chain performance (β=-0.120, p=0.002), with the highest R^2 of 0.645.

5.3 Discussions of the Findings

This section provides discussions of the findings

5.3.1 Electronic Order Processing System

The study findings indicated that the electronic order processing system has increased customer satisfaction by providing faster order fulfillment. These findings are consistent with the study done by Heuwinkel (2022) showed that from a business point of view, order processing in warehouses and distribution centers, flexible and transparent distribution processes, and finally customer-oriented, exceptional customer service contribute to meeting customer expectations. The system provides real-time inventory visibility, enabling efficient production planning. These findings are consistent with the study

done by Arica and Powell, (2014) showed that automatic real-time planning and control systems promise substantial advantages to manufacturing companies, especially those that operate within fluctuating and competitive market conditions within a demand-driven manufacturing environment, since flexibility and robustness of the planning and control system are the inherent enablers for a high level of responsiveness in this type of industry.

The system offers easy access to order history and tracking information for both internal and external stakeholders. A study by Gualandris et al., (2015) emerges that firms have developed a wide variety of monitoring systems in order to align with stakeholders' expectations and leverage accountability to stakeholders. Further, the study findings indicated that the system automates order processing tasks, reducing manual errors and processing time. These findings agreed with Parasuraman, Mouloua, Molloy, and Hilburn (2018), who suggested that human monitoring can be inefficient, particularly after long periods of time at work, automating the monitoring function has been proposed as a solution.

5.3.2 Transportation Management System

The study findings showed that the majority of the respondents agreed that the TMS effectively tracks and manages inbound and outbound shipments. According to the study done by Fagerberg and Ungerth, (2023), indicate numerous potential effects resulting from a successful implementation of the TMS. From the operational perspective, using a TMS would decrease the human errors and misunderstandings due to inconsistent communication, as well as increase the pace of decision-making in time-sensitive situations. The

TMS facilitates efficient communication with carriers and logistics partners. The study by Egert and Repo Wecklauf, (2023) evident that invoice management, order management, and data and analytics management hold more influence on the selection and adoption of a TMS than other requirements. Additionally, the majority of respondents agreed that the TMS helps in managing freight costs and negotiating better rates with carriers. The study by Santos and Piva (2020) found that it was possible to reduce the execution time of the month-end process by 3 days.

5.3.3 Automated Warehousing System

Automated warehousing systems significantly improve order fulfillment accuracy in manufacturing firms. The study done by Custodio et al. (2020) flexible automated warehouse is the combination of automated equipment, data collection technologies, and management solutions. Consequently, the majority of the respondents agreed that integrating an automated warehousing system with a company's production planning software improves overall efficiency. The previous research done by Custodio et al. (2020) flexible automated warehouse is the combination of automated equipment, data collection technologies, and management solutions.

The initial investment cost of an automated warehousing system is a major barrier to adoption for many manufacturers. According to Marchet, Melacini, and Perotti (2015) showed that the OPS type implemented, their automation level, and the main information and communication technology systems in place to support picking activities. The automated warehousing systems require a high level of technical expertise to operate and maintain. The study

by Mahroof, (2019) revealed a plethora of insights regarding AI, as well as other forms of technology within the warehouse environment. Additionally, safety concerns regarding automated vehicles and machinery within a warehouse are a significant deterrent for some manufacturers. However, a study by Custodio et al. (2020) flexible automated warehouse is the combination of automated equipment, data collection technologies, and management solutions.

5.3.4 Inventory Management System

The study findings showed that most of the respondents agreed that their inventory management system provides accurate real-time data on stock levels. The findings done by Fang and Chen (2022) show inventory management operation enhancements, a reduction in the cost and the total execution time, a reduction in the response time for the benefit of the customer, and an increase in system performance efficiency. A handful of the respondents agreed that the system effectively forecasts demand for raw materials and finished goods. Assis and Sagawa (2018) reveal that most of the employees declared themselves very satisfied with logistic operations performance, and the average grade for logistic operations quality after implementation was 8.63. The study results showed that quite a number of the respondents agreed that the system minimizes stockouts and production delays. The study findings agreed with Rajendran and Ravindran (2019), showed that hospitals and blood centers can choose the best ordering policy for their particular demand and cost setting.

Their inventory management system helps us optimize storage space utilization. Similarly, the study results showed that the majority of the respondents agreed that the system allows for efficient order processing and reduces lead times. The study findings agreed with Kamau and Kagiri, (2015) found that inventory shrinkage, inventory investment, and inventory turnover affect the competitiveness of Safaricom Ltd. Also, they can track inventory movement and identify potential shrinkage or theft. The study findings concurred with Eminue, Titus, and Udo (2019) revealed that there is a significant influence of stock taking and stock auditing on safeguarding of inventory shrinkage in large-scale retail outlets.

5.3.5 Enterprise Resource Planning

The study results showed that a good number of the respondents agreed that the implementation of an ERP system has significantly improved the efficiency of our production processes. Additionally, the study's findings demonstrated that the majority of the respondents agreed that the ERP system provides real-time data on inventory levels, allowing for better production planning and reduced stockouts.

The integration of all departments (e.g., production, sales, and finance) through the ERP system has enhanced communication and collaboration. These findings agree with Li, Wu, Zong and Li, (2017) indicated that organizational preparedness (in terms of internal culture, organizational structure, availability of resources, and technological capabilities), positive benefits and costs perception, and external influences (in terms of environmental uncertainty, competitive pressure, and partner readiness) would

facilitate inter-organizational knowledge sharing, which in turn, would enhance ERP implementation effectiveness.

The reporting capabilities of the ERP system allow for better decision-making by providing insightful data on production costs, performance metrics, and sales trends. This finding agrees with Huang and Handfield (2015) suggest that ERP users are more mature than non-ERP users in three key indicators: strategic sourcing, category management, and supplier relationship management. Moreover, SAP ERP users are more mature than non-ERP users in strategic sourcing, category management, and supplier relationship management.

The user interface of the ERP system is user-friendly and easy to navigate for employees across all departments. According to Althonayan and Althonayan (2017) reveals that system quality factors (flexibility, compatibility, availability of right data, availability of currency, ease of use, and timeliness) were found to affect performance positively, as were service quality factors (tangibility, reliability, responsiveness, and assurance). The training provided for employees on how to use the ERP system was adequate and prepared them for its successful adoption. The study agreed Seethamraju, (2015) found that the determining factors in deciding to adopt SaaS ERP are software vendor's reputation in the market, software fit to the business, the potential willingness of the vendor to support the customer throughout the product life cycle, the vendor's participation in co-creation of value for customers and the generic benefits of implementing an integrated ERP system.

5.3.6 Supply Chain Performance

The study results revealed that the majority of the respondents agreed that they are able to quickly adapt our production plans to changes in customer demand. These findings concur with the study done by Siagian et al (2021) showed that supply chain integration affects innovation system, supply chain flexibility, and supply chain resilience because of its ability to share complete product information and share production planning. They have good visibility into inventory levels across their entire supply chain. These findings concur with the study done by Srinivasan and Swink, (2018) indicate that analytics capability and organizational flexibility are more valuable as complementary capabilities for firms who operate in volatile markets, rather than in stable ones.

5.3.7 Moderating Influence of Electronic Resource Planning on the Relationship between Electronic Order Processing System and Supply Chain Performance

Enterprise resource planning has a moderating influence on the relationship between electronic order processing system and supply chain performance of manufacturing firms. The study findings agreed with Khan and Khan (2022), who underscore the critical role of ERP systems in modern supply chain management. Ahmed and Ali (2022) find that effective implementation of ERP leads to better inventory management and overall efficiency in supply chain operations. Omondi (2020) indicated that improvements in delivery performance and order fulfillment lead times occur with effective ERP utilization. Kaur et al., (2021) highlight that while many organizations

recognize the benefits of ERP systems, their impact on supply chain performance may not be universally significant due to various implementation challenges and organizational factors that can hinder effectiveness. Smith, johnson and Brown (2019) emphasize that some sectors may experience less pronounced benefits from ERP implementations compared to others, which challenges the universality of the findings related to manufacturing firms specifically.

5.3.8 Moderating Influence of Electronic Resource Planning on the Relationship between Transportation Management System and Supply Chain Performance

The study findings revealed that electronic resource planning moderates the relationship between transportation management system and supply chain performance. The study findings agreed with Kolev and Otsetova (2022) who found that ERP systems significantly enhance logistics performance, particularly in areas such as transport management and documentation. Effective ERP implementation leads to improved coordination between TMS and overall supply chain performance, suggesting a moderating role of ERP in these relationships.

Additionally, Korkmaz et al., (2019) emphasized that ERP can strengthen the relationship between TMS and supply chain performance by providing real-time data and improving operational efficiency. Venkatesh and Morris (2003) highlight that ERP systems contribute significantly to various aspects of supply chain management, including transportation management. ERP not

only enhances the efficiency of TMS but also positively affects overall supply chain performance, indicating a moderating influence.

Furthermore, Gunasekaran and Ngai (2004) indicated that integrating TMS with ERP systems can present challenges that may hinder their effectiveness in enhancing supply chain performance. Issues such as data silos and lack of real-time information sharing can limit the potential benefits of ERP as a moderator in this relationship. Also, Helo and Shankar (2009) revealed that the impact of ERP systems on transportation management varies significantly across different sectors, suggesting that their moderating role may not be consistent or strong enough to universally enhance supply chain performance in all industries.

5.3.9 The Moderating Influence of Electronic Resource Planning on the Relationship between Transportation Management System and Supply Chain Performance

ERP does not mediate the relationship between automation warehousing systems and SC performance. The results aligned with Qureshi (2022) who pointed out that even though ERP systems improve other issues with the supply chain, including process flows and business expenses, they do not strongly mediate the relationship between automation systems and overall supply chain performance. What ERP does is more of support in wrapping the complexity than adding value to the effectiveness of automated warehousing systems.

Also, Odoyo and Ojera (2020) affirmatively concluded that there is a positive correlation between ERP system adoption and supply chain performance indicators. However, it also indicated moderating negative relationships with several dimensions of ERP, namely integration management and production planning. Thus, the findings of the current study are consistent with prior research showing that ERP can enhance some aspects of performance; however, it does not relate to the impact of moderating benefits achieved by automation technologies in warehousing operations. Although Tarigan et al (2021) have recognized that the implementation of ERP systems could enhance efficiency and managerial activities, they suggest that the implementation of ERP systems cannot act as a mediator between supply chain warehouse automation and the supply chain outcomes. ERP system does not lead to improvements in supply chain performance, but it is the automation technologies where improvements mainly originate.

5.3.10 Moderating Influence of Electronic Resource Planning on the Relationship between Inventory Management System and Supply Chain Performance

However, a moderation process of electronic resource planning of the relationship of inventory management systems to supply chain performance exists. The study results were in line with Teerasoponpong and Sopadang, (2022), who pointed out that it is easy to access data with the help of an ERP system, and this leads to effective decision-making of inventory management. ERP possesses a moderating role since it boosts the correlation of effective inventory management to overall supply chain performance by enhancing the

integrated information system across the business processes, thereby minimizing clashes and enhancing coordination.

In addition, Gupta & Sachan (2024) established that ERP usage improves the evaluation of inventory, the prediction of demands, and stock restocking. These findings show that ERP enhances the effectiveness of inventory management systems to antecedent variables. It also suggests that ERP enhances the positive relationship between SC performance and inventory processes; thus, the ERP system moderates the effectiveness of inventory management systems due to better visibility of these processes.

Furthermore, the study conducted by Hou et al (2021) found that inventory management systems contribute to the improvement of the company's operational efficiency, and the existence of an ERP system improves these achievements due to the integrated data within departments. Such a synchronization helps ERP in achieving a central common view to reduce inventories that better suit market requirements, hence we get support for our hypothesis that ERP moderates the relationship between IM and SCP.

5.4 Conclusion of the Study

This brings the conclusion that the electronic order processing system has enhanced and enhanced organizational communication between the departments, enhancing the delivery of orders and satisfaction of customers. They further conclude that the use of the system increases real-time inventory visibility, improves fast and accurate order entry, and decreases on chances of making manual mistakes as well as the time taken to process the orders. The

work also establishes that TMS improves transportation routes, minimizes the delivery time and cost, as well as improves the visibility of shipment status. Furthermore, this research also states that TMS optimizes freight expenditure and helps in enhancing the relationship with the supply chain network.

The study also concludes that the use of automated warehousing systems increases order fulfillment accuracy, reduces employee costs, and increases operations management through integration with production planning software. However, it notes that higher initial capital costs and risks of product failure prevent many producers from embracing the technology. Considering practical implications, this research suggests that inventory management systems offer accurate real-time information on inventory levels, efficient use of space in inventory, low stock-out rates, and lower lead times to be important aspects that enhance supply chain operations in manufacturing firms.

The results confirm the significance of integrated systems concerning supply chain performance and ERP's role as a moderator. The findings of the current study, which was established through the hierarchical moderated regression analysis, were that ERP played a moderating role between these systems and supply chain performance. Whereas ERP had a positive influence on the electronic order processing and transportation management system, a negative impact was observed when it influenced the relationship between inventory management and supply chain performance. This implies that even though there is effectiveness in ERP, mostly in augmenting the effectiveness of some systems, it would also bring issues that affect performance in certain systems.

5.5 Theoretical Implications of the Study

The result of this study supports the RBT by providing evidence of internal resources like the ERP system and e-logits technology as core enablers of the performance of the supply chain. In RBT, a firm's competitive advantage accrues from the use of resources that are valuable, rare, inimitable, and non-substitutable. In this study, ERP systems were proven to be central assets that support collaboration, integration, and goal improvement in lots of the SC functions.

The research offers a case that fills the gap between RBT and Innovation Theory to show that integration of internal resources (ERP) and external technological (e-logistics systems) enhances supply chain performance. The incorporation of ERP as a moderator between e-logistics systems and performance confirms the dual perspective of resource-based view and innovation management strategy. There is an indication that firms that have internal competence and adopt new technologies are in a better place to unravel a compounded approach to supply chains.

5.6 Policy Implications of the Study

The study has important policy implications, especially for policymakers and industrial regulators in the manufacturing industries. The implications of the research are to encourage the formulation of polices for the implementation of ERP systems and e-logistics technologies in SMFs.

Thus, governments and industry bodies could propose tax benefits or subsidies to assist firms in funding the adoption of these technologies, which in turn

boost the efficiency of the firm's operations and the overall performance of the supply chain. Resultant policies would also address the existing gap in technology adoption between corporate giants and SMEs, thus transforming the entire market so that companies of all sizes can tap into the options offered by the advanced supply chain.

Such initiatives should be advocated by policymakers in governance by ensuring the right infrastructure and human capital to ensure that the digitization of supply chain management is efficient to support.

Authorities should give attention to the elements that make it possible for the adoption of policies that set general requirements for integration and compatibility of ERP systems. It is postulated that standardization could help to reduce interfaces between firms and their suppliers and improve the collaboration and exchange of data along their supply chains or networks.

5.7 Practical Implications of the Study

Firms should prioritize the implementation of ERP systems, as they act as the backbone for integrating various e-logistics components such as EOPS, TMS, AWS, and IMS. This integration ensures smoother operations, improved data management, and better decision-making capabilities.

The study also underscores the necessity for continuous training programs to ensure employees are proficient in using ERP and e-logistics systems. Simply implementing the technology is not sufficient; firms must invest in upskilling their workforce to fully leverage these systems’ capabilities.

Training should focus on data analytics, system integration, and real-time decision-making to help employees understand how to use the technology effectively in daily operations. When employees are well-versed in these systems, they can significantly improve productivity, reduce operational errors, and contribute to overall supply chain performance.

5.8 Recommendation of the Study

The main objective of the study was to determine the moderating effect of electronic resource planning on the relationship between e-logistics and supply chain performance of manufacturing firms, in Uasin Gishu County, Kenya. The study recommends that:

Manufacturing firms invest in enhancing the integration of their electronic order processing systems with other enterprise resource planning (ERP) systems to further streamline operations and boost efficiency. Moreover, companies should leverage the system's ability to provide real-time inventory visibility to improve production planning, reduce stockouts, and optimize order fulfillment.

Manufacturing firms should continuously optimize transportation routes and invest in advanced analytics within their TMS to increase efficiency in shipment management and cost reduction. Close collaboration with carriers and logistics partners should also be encouraged, utilizing the communication capabilities of the TMS to enhance real-time decision-making and issue resolution.

It is recommended that manufacturing firms perform a thorough cost-benefit analysis before implementing automated warehousing systems, ensuring that the long-term gains in efficiency and labor savings justify the initial investment. In addition, companies should invest in regular technical training for staff to develop the expertise required to operate and maintain these systems, reducing the likelihood of operational issues.

To further prevent stockouts and reduce lead times, firms could consider incorporating predictive analytics into their inventory management systems, enabling them to better anticipate demand fluctuations. On top of that, companies should strengthen security measures within their inventory management systems to improve tracking of inventory movement, thereby minimizing shrinkage or theft and safeguarding their assets.

5.9 Suggestion for further studies

The study opens avenues for further research into the nuanced interactions between different management systems and their collective impact on supply chain performance. Future studies could explore the conditions under which ERP systems enhance or hinder performance, as well as the potential mediating factors that could influence these relationships. Future research could investigate other factors that may influence supply chain performance, such as technological advancements, employee training, and organizational culture, to provide a more comprehensive understanding of the dynamics at play.

Conducting longitudinal studies could help in understanding the long-term effects of electronic order processing systems, transportation management systems, automated warehousing systems, inventory management systems, and enterprise resource planning on supply chain performance. Further studies could focus on specific industries to determine if the relationships observed in this study hold across different sectors, such as retail, healthcare, or technology.

Since ERP did not moderate the relationship between automated housing systems and supply chain performance, further studies should be conducted in other sectors or contexts, as this could reveal different findings based on different sample sizes and diversity.

Future research should aim to increase sample sizes and include a broader range of employees within organizations to enhance the representativeness of findings. This could involve shifting from census sampling techniques to more diverse methodologies that capture a wider array of perspectives.

Incorporate both primary and secondary data in future studies to enrich the analysis and support more robust conclusions. Utilizing diverse data sources can provide a comprehensive view of how ERP systems operate within different contexts.

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APPENDIX

APPENDIX I: CONSENT LETTER

To: Whom it may concern

Dear Sir/Madam,

RE: THE REQUEST FOR YOUR RESPONSE TO MY RESEARCH QUESTIONNAIRE

My name is Clara Chepkemoi a master's student at the university of Eldoret, school of Business Management. I am inviting you to participate in a research study entitled, "**Moderating Influence of Electronic Resource Planning on The Relationship Between E-Logistics and Supply Chain Performance of Manufacturing Firms, In Uasin Gishu County, Kenya."** Your participation in this study is voluntary, and you may choose to leave at any time. In addition, your responses to the survey questionnaire will be anonymous. Please do not write any identifying information on the questionnaire. Every effort will be made by the researcher to preserve your confidentiality. The information gathered from this study is purely for academic purposes and will not be shared anywhere.

Contact Information

In case of any clarification or information concerning the study, kindly contact my supervisors, Dr. Pauline Keitany – 0710389167 or Dr. Zachariah Shitote-0707955894.

CONSENT

I have read and understood the information provided, and I've had the opportunity to ask questions. I understand that my participation is entirely voluntary and that I may withdraw at any time, without explanation, and at no cost. I understand that I will receive a copy of this consent form. I voluntarily agree to participate in this study.

Participant's signature _____Date _____

Investigator's signature _____Date _____

APPENDIX II: RESEARCH STUDY QUESTIONNAIRE

Please do not write your name on this questionnaire; put a tick (√) or (x) in the box as your response. **Section A: Background Information**
Please place a tick "√" for each of the following:
1. Gender: ( ) Male ( ) Female
2. Age: ( ) Below 20 ( ) 21 – 25 ( ) 26 – 30 ( ) 31 – 35 ( ) Above 36
3. Level of Education: High School **( )** Certificate ( ) Diploma ( ) Undergraduate ( ) Master's Degree ( ) PhD ( )
4. Number of years the business been in operation:
Below 5 years ( ) 6-10 years ( ) 11-15 years ( ) Above 16 years
5. Total number of employees working for this company:
Below 50 ( ) 51- 100 ( ) 101- 200 ( ) Above 201 ( )

SECTION B: ELECTRONIC ORDER PROCESSING SYSTEM

Please indicate the extent to which you agree or disagree with each of the following statement by placing a tick where appropriate using the following 5-Point Likert scale: Strongly Disagree =1, Disagree =2, Neutral =3, Agree = 4, Strongly Agree =5

STATEMENTS	**1**	**2**	**3**	**4**	**5**
1. The electronic order processing system in our firm allows for quick and accurate order entry.					
2. The system provides real-time inventory visibility, enabling efficient production planning.					
3. The electronic order processing system has improved communication and collaboration between departments (sales, production, and inventory).					
4. The system automates order processing tasks, reducing manual errors and processing time.					
5. The electronic order processing system has increased customer satisfaction by providing faster order fulfillment.					
6. The system offers easy access to order history and tracking information for both internal and external stakeholders.					
7. Our electronic order processing system integrates seamlessly with other enterprise resource planning (ERP) systems within the company.					

SECTION C: TRANSPORTATION MANAGEMENT SYSTEM

Please indicate the extent to which you agree or disagree with each of the following statement by placing a tick where appropriate using the following 5-Point Likert scale: Strongly Disagree =1, Disagree =2, Neutral =3, Agree = 4, Strongly Agree =5

STATEMENTS	1	2	3	4	5
8. The TMS effectively tracks and manages inbound and outbound shipments.					
9. The TMS optimizes transportation routes, leading to reduced delivery times and costs.					
10. The TMS provides real-time visibility into shipment status, improving supply chain transparency.					
11. The TMS facilitates efficient communication with carriers and logistics partners.					
12. The TMS helps in managing freight costs and negotiating better rates with carriers.					
13. The TMS enables proactive exception management, allowing for faster response to delays or disruptions.					
14. The TMS integrates seamlessly with existing manufacturing and warehouse management systems.					

SECTION D: AUTOMATED WAREHOUSING SYSTEM

Please indicate the extent to which you agree or disagree with each statement by placing a tick where appropriate using the following 5-Point Likert scale: Strongly Disagree =1, Disagree =2, Neutral =3, Agree =4, Strongly Agree =5.

STATEMENTS	1	2	3	4	5
8. Automated warehousing systems significantly improve order fulfillment accuracy in manufacturing firms.					
9. Implementing an automated warehousing system leads to a reduction in labor costs for manufacturers.					
10. Integrating an automated warehousing system with a company's production planning software improves overall efficiency.					
11. The initial investment cost of an automated warehousing system is a major barrier to adoption for many manufacturers.					
12. Automated warehousing systems require a high level of technical expertise to operate and maintain.					
13. Safety concerns regarding automated vehicles and machinery within a warehouse are a					

significant deterrent for some manufacturers.					
14. Automated warehousing systems can help manufacturers adapt to fluctuations in demand more effectively.					

SECTION E: INVENTORY MANAGEMENT SYSTEM

Please indicate the extent to which you agree or disagree with each statement by placing a tick where appropriate using the following 5-Point Likert scale: Strongly Disagree =1, Disagree=2, Neutral=3, Agree=4, Strongly Agree=5

STATEMENTS	**1**	**2**	**3**	**4**	**5**
8. Our inventory management system provides accurate real-time data on stock levels.					
9. The system effectively forecasts demand for raw materials and finished goods.					
10. We can easily identify and eliminate obsolete or slow-moving inventory.					
11. The system minimizes stockouts and production delays.					
12. Our inventory management system helps us optimize storage space utilization.					
13. The system allows for efficient order processing and reduces lead times.					
14. We can track inventory movement and identify potential shrinkage or theft.					

SECTION F: ENTERPRISE RESOURCE PLANNING

Please indicate the extent to which you agree or disagree with each statement by placing a tick where appropriate using the following 5-Point Likert scale: Strongly Disagree =1, Disagree =2, Neutral =3, Agree =4, Strongly Agree =5

STATEMENTS	**1**	**2**	**3**	**4**	**5**
8. The implementation of an ERP system has significantly improved the efficiency of our production processes.					
9. The ERP system provides real-time data on inventory levels, allowing for better production planning and reduced stockouts.					
10. The integration of all departments (e.g., production, sales, finance) through the ERP system has enhanced communication and collaboration.					
11. The reporting capabilities of the ERP system allow for better decision-making by providing insightful data on production costs, performance metrics, and sales trends.					

12. The user interface of the ERP system is user-friendly and easy to navigate for employees across all departments.					
13. The training provided for employees on how to use the ERP system was adequate and prepared them for its successful adoption.					
14. The implementation of the ERP system has led to a significant reduction in errors and improved data accuracy across the manufacturing process.					

SECTION G: SUPPLY CHAIN PERFORMANCE OF MANUFACTURING FIRMS

Please indicate the extent to which you agree or disagree with each statement by placing a tick where appropriate using the following 5-Point Likert scale: Strongly Disagree =1, Disagree=2, Neutral=3, Agree=4, Strongly Agree=5

STATEMENTS	**1**	**2**	**3**	**4**	**5**
8. Our suppliers consistently deliver materials on time and in full.					
9. Our manufacturing process experiences minimal disruptions due to supply chain issues.					
10. We are able to quickly adapt our production plans to changes in customer demand.					
11. We have good visibility into inventory levels across our entire supply chain.					
12. Our finished products are delivered to customers on time and within budget.					
13. We are able to negotiate favorable prices with our suppliers.					
14. We have strong communication and collaboration with our supply chain partners.					

Thank you

APPENDIX III: UNIVERSITY PERMISSION LETTER

University of Eldoret
flame of knowledge and innovation

P. O. Box 1125 - 30100, Eldoret, Kenya
Tel: +254 53 2063257 /2033712/13 Ext. 2352/3
Mob: 0736 493555; Fax: +254 53 206 3257
E-mail: hodbbusinessmgt@uoeld.ac.ke
Website: www.uoeld.ac.ke

OFFICE OF THE DEPUTY VICE CHANCELLOR (ASA)
SCHOOL OF BUSINESS, ECONOMICS AND MANAGEMENT SCIENCES
DEPARTMENT OF BUSINESS MANAGEMENT

THE EXECUTIVE SECRETARY, **DATE**: 10th SEPTEMBER, 2024

NATIONAL COUNCIL FOR SCIENCE TECHNOLOGY & INNOVATION

P.O BOX 30623 – 00100,

NAIROBI.

Dear Sir/Madam,

SUBJECT: REQUEST FOR NACOSTI LICENSE – CLARA CHEPKEMOI SBUS/BBM/M/010/21

Reference is made to the above named who is applying to the National Commission for Science Technology and Innovation for a Research permit.

Ms Clara is a student at University of Eldoret undertaking a Master Degree in Business Management in the School of Business, Economics and Management Science. She has completed presenting her research proposal titled "*Influence of E-Logistics on Supply Chain Performance of Manufacturing Firms, In Uasin Gishu County, Kenya, Moderated by Enterprise Resource Planning''*

Any assistance accorded to her will be highly appreciated.

Thank you

HOD
Business Management
Dept.
UNIVERSITY OF ELDORET

DR. EMMANUEL TANUI
HEAD, DEPARTMENT OF BUSINESS MANAGEMENT
CC.DEAN, SCHOOL OF BUSINESS, ECONOMICS AND MANAGEMENT SCIENCE

APPENDIX IV: UNIVERSITY LETTER

University of Eldoret
flame of knowledge and innovation

P. O. Box 1125 - 30100, Eldoret, Kenya
Tel: +254 53 2063257 /2033712/13 Ext. 2352/3
Mob: 0736 493555; Fax: +254 53 206 3257
E-mail: hodbbusinessmgt@uoeld.ac.ke
Website: www.uoeld.ac.ke

OFFICE OF THE DEPUTY VICE CHANCELLOR (ASA)

SCHOOL OF BUSINESS, ECONOMICS AND MANAGEMENT SCIENCES
DEPARTMENT OF BUSINESS MANAGEMENT

REF: UOE/B/BBM/ATT/032 **DATE**: 10 TH SEPTEMBER, 2024

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE:DATA COLLECTION- CLARA CHEPKEMOI SBUS/BBM/M/010/21

The bearer of this letter is a postgraduate student in the Department of Business Management. The student is currently undertaking Research, collecting data for the proposal titled "*Influence of E-Logistics on Supply Chain Performance of Manufacturing Firms, In Uasin Gishu County, Kenya, Moderated by Enterprise Resource Planning''*

Any assistance accorded to her will be highly appreciated.

Thank you

HOD
Business Management
Dept.
UNIVERSITY OF ELDORET

DR. EMMANUEL TANUI
HEAD, DEPARTMENT OF BUSINESS MANAGEMENT

APPENDIX V: NACOSTI LETTER

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **412308**

Date of Issue: **26/September/2024**

RESEARCH LICENSE

This is to Certify that Ms.. CLARA CHEPKEMOI of University of Eldoret, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Uasin-Gishu on the topic: INFLUENCE OF E-LOGISTICS ON SUPPLY CHAIN PERFORMANCE OF MANUFACTURING FIRMS, IN UASIN GISHU COUNTY, KENYA, MODERATED BY ENTERPRISE RESOURCE PLANNING for the period ending : 26/September/2025.

License No: **NACOSTI/P/24/40154**

412308

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013 (Rev. 2014)

Legal Notice No. 108: The Science, Technology and Innovation (Research Licensing) Regulations, 2014

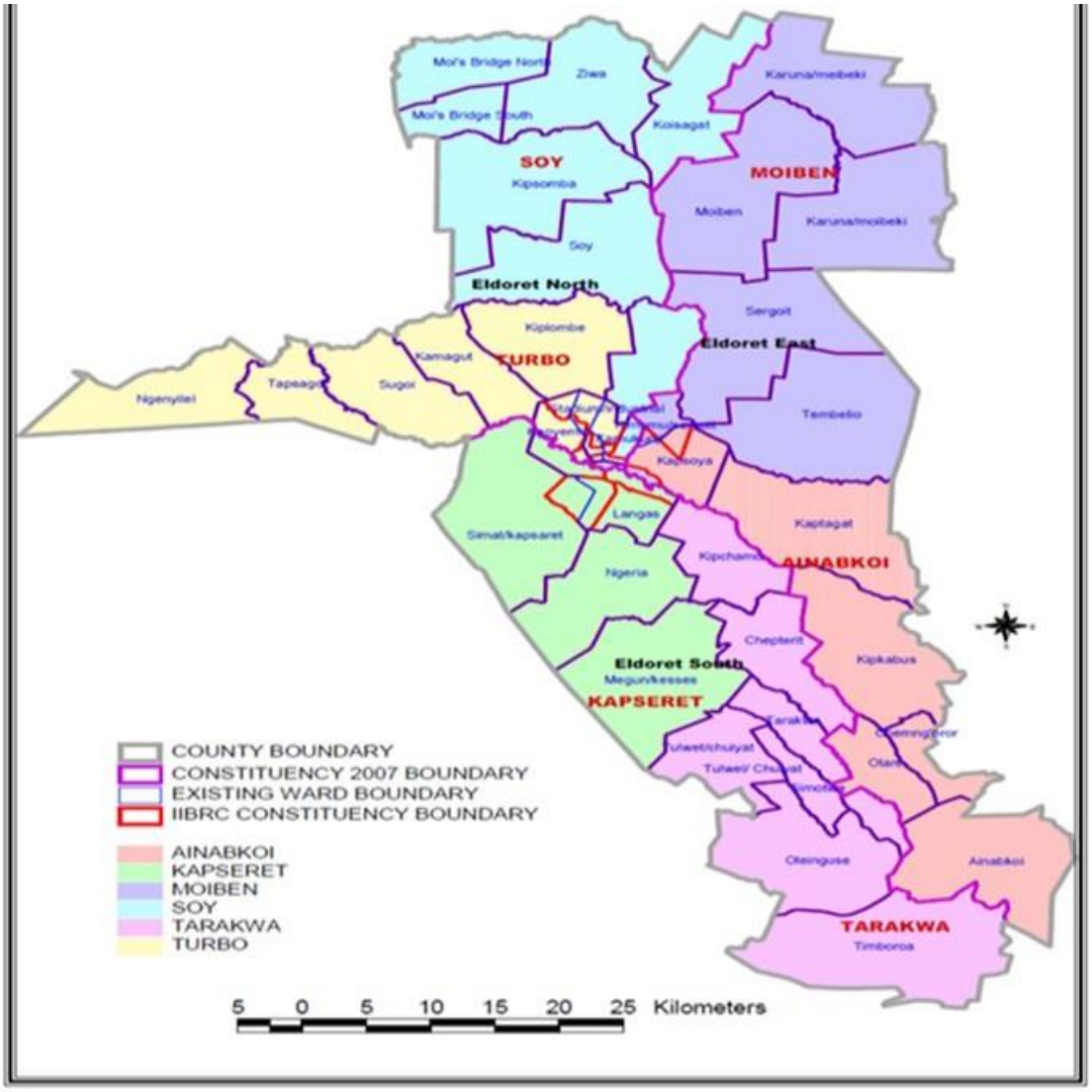
The National Commission for Science, Technology and Innovation, hereafter referred to as the Commission, was the established under the Science, Technology and Innovation Act 2013 (Revised 2014) herein after referred to as the Act. The objective of the Commission shall be to regulate and assure quality in the science, technology and innovation sector and advise the Government in matters related thereto.

CONDITIONS OF THE RESEARCH LICENSE

1. The License is granted subject to provisions of the Constitution of Kenya, the Science, Technology and Innovation Act, and other relevant laws, policies and regulations. Accordingly, the licensee shall adhere to such procedures, standards, code of ethics and guidelines as may be prescribed by regulations made under the Act, or prescribed by provisions of International treaties of which Kenya is a signatory to
2. The research and its related activities as well as outcomes shall be beneficial to the country and shall not in any way;
    i. Endanger national security
    ii. Adversely affect the lives of Kenyans
    iii. Be in contravention of Kenya's international obligations including Biological Weapons Convention (BWC), Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), Chemical, Biological, Radiological and Nuclear (CBRN).
    iv. Result in exploitation of intellectual property rights of communities in Kenya
    v. Adversely affect the environment
    vi. Adversely affect the rights of communities
    vii. Endanger public safety and national cohesion
    viii. Plagiarize someone else's work
3. The License is valid for the proposed research, location and specified period.
4. The license any rights thereunder are non-transferable
5. The Commission reserves the right to cancel the research at any time during the research period if in the opinion of the Commission the research is not implemented in conformity with the provisions of the Act or any other written law.
6. The Licensee shall inform the relevant County Director of Education, County Commissioner and County Governor before commencement of the research.
7. Excavation, filming, movement, and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
8. The License does not give authority to transfer research materials.
9. The Commission may monitor and evaluate the licensed research project for the purpose of assessing and evaluating compliance with the conditions of the License.
10. The Licensee shall submit one hard copy, and upload a soft copy of their final report (thesis) onto a platform designated by the Commission within one year of completion of the research.
11. The Commission reserves the right to modify the conditions of the License including cancellation without prior notice.
12. Research, findings and information regarding research systems shall be stored or disseminated, utilized or applied in such a manner as may be prescribed by the Commission from time to time.
13. The Licensee shall disclose to the Commission, the relevant Institutional Scientific and Ethical Review Committee, and the relevant national agencies any inventions and discoveries that are of National strategic importance.
14. The Commission shall have powers to acquire from any person the right in, or to, any scientific innovation, invention or patent of strategic importance to the country.
15. Relevant Institutional Scientific and Ethical Review Committee shall monitor and evaluate the research periodically, and make a report of its findings to the Commission for necessary action.

National Commission for Science, Technology and
Innovation(NACOSTI),
Off Waiyaki Way, Upper Kabete,
P. O. Box 30623 - 00100 Nairobi, KENYA
Telephone: 020 4007000, 0713788787, 0735404245
E-mail: dg@nacosti.go.ke
Website: www.nacosti.go.ke

APPENDIX VI: MAP OF UASIN GISHU COUNTY



Source: County Government of Uasin Gishu (2019)

APPENDIX VII: LIST OF MANUFACTURING FIRMS IN UASIN GISHU

1. Agricultural Manufacturing Equipment's
2. Brookside Dairy Limited.
3. CFAO Agri Limited.
4. Chomila Bottlers Ltd
5. Crown Paints Ltd
6. Ditman Constructions
7. Doinyo Lessos Creameries.
8. Dola Millers
9. Eldoret Grains Packers
10. Fablon Woven Enterprises.
11. Fantex Kenya Limited.
12. Farmyard International Ltd
13. Hari Shari Pipes
14. Jamii Millers
15. Jumbo E.A. Ltd
16. Ken-Knit Kenya Ltd.
17. MACE Foods
18. Mfalme Millers.
19. New Kenya Cooperative Creameries Ltd
20. Pyramid Plastics
21. Rafiki Millers.
22. Raiply Woods Limited.
23. Rift Valley Botters

24. Rivertex Enterprises Ltd
25. Rudra Constructions Ltd
26. Sirikwa Quarry Limited.
27. TCL Wood Treatment Ltd
28. Unga Limited.
29. Vishva Builders and Properties.
30. Wareng Ndovu Ltd

Source: Kenya Association of Manufacturers (KAM) (2024)

APPENDIX VIII: SIMILARITY REPORT

University of Eldoret

University of Eldoret

Certificate of Plagiarism Check for Thesis

Author Name	CLARA CHEPKEMOI SBUS/BBM/010/21
Course of Study	Type here...
Name of Guide	Type here...
Department	Type here...
Acceptable Maximum Limit	Type here...
Submitted By	titustoo@uoeld.ac.ke
Paper Title	INFLUENCE OF E-LOGISTICS ON SUPPLY CHAIN PERFORMANCE OF MANUFACTURING FIRMS, IN UASIN GISHU COUNTY, KENYA. MODERATED BY ELECTRONIC RESOURCE PLANNING
Similarity	8%
Paper ID	4600035
Total Pages	168
Submission Date	2025-10-31 08:23:33

Signature of Student

Signature of Guide

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Head of the Department

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