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**EFFECT OF TECHNOLOGY ORGANIZATION ENVIRONMENT FRAMEWORK
ON THE ADOPTION OF E-COMMERCE IN LOGISTIC FIRMS IN NAIROBI
COUNTY**

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MBA/39604/2018

**A RESEARCH DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF
THE REQUIREMENTS OF THE DEGREE OF MASTER OF BUSINESS
ADMINISTRATION AT STRATHMORE UNIVERSITY**

NOVEMBER 2020

DECLARATION

Students Declaration

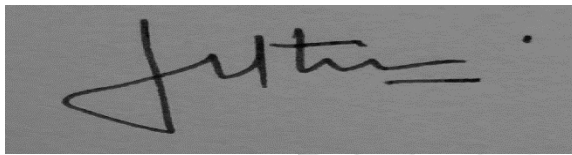
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This research dissertation has been submitted for examination with my approval as the university supervisor

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ABSTRACT

Globally, logistics and supply chains have been rapidly migrating from traditional processes to more technologically-driven service provision. The local logistics industry has lagged behind in the integration of e-commerce with only the largest firms and multinational firms implementing new technologies. This has seen most of the local firms fall behind their competitiveness. Nevertheless, there is insufficient empirical evidence on the various factors affecting e-commerce adoption within the industry. This study sought to establish the influence of technology, organization, and environmental factors on the adoption of e-commerce. This study was grounded in the technology acceptance model and the innovation diffusion theory. The research was guided by a pragmatism research philosophy with a descriptive research design being adopted. The study focused on the 477 logistics firms operating within Nairobi County. The sample size for the study was 217 logistic firms calculated using the Yamane formula. The unit of observation was the managers of the local logistic firms. The study relied on a structured research questionnaire in the data collection. This study further adopted the drop and picked method in the data collection. The collected research data were analyzed using descriptive, correlation and regression analysis. The findings were presented using bar graphs, charts, and tables. The results indicate that most of the firms within the logistics industry have integrated e-commerce systems in the operations which have fostered the firm efficiency. The correlation results indicated there was a statistically significant association between technology factors, organization factors, environment factors and e-commerce adoption. The regression results indicated that technology factors and organization factors had a statistically significant influence on e-commerce adoption while environment factors had an insignificant influence on e-commerce adoption. The research recommends that logistic firms should enhance their investment in information technology infrastructure and ensure alignment of their structure and culture to the e-commerce systems. The study also recommended that logistic firms should seek collaborations with other players in the industry to build synergistic benefits that can be key to e-commerce adoption. The study was limited by the Covid-19 lockdown measures which impacted the data collection negatively since most firms have scaled down on their operations. The study suggests that further research should be conducted to establish the impact of government regulations and business environment on the logistics industry.



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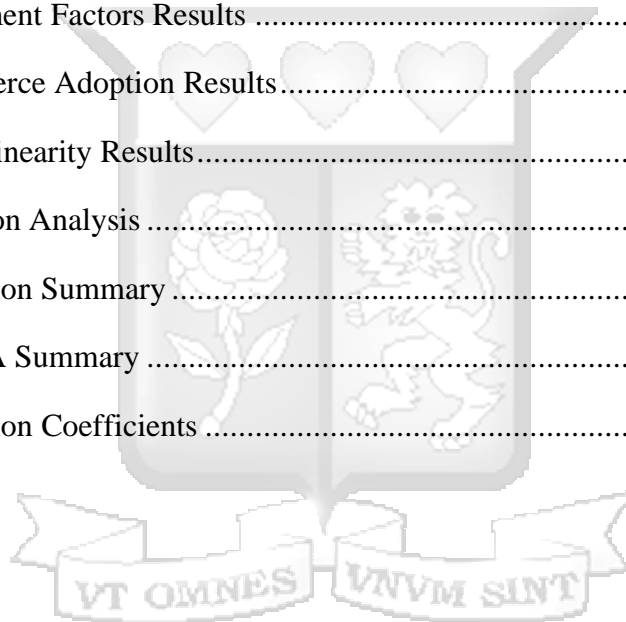
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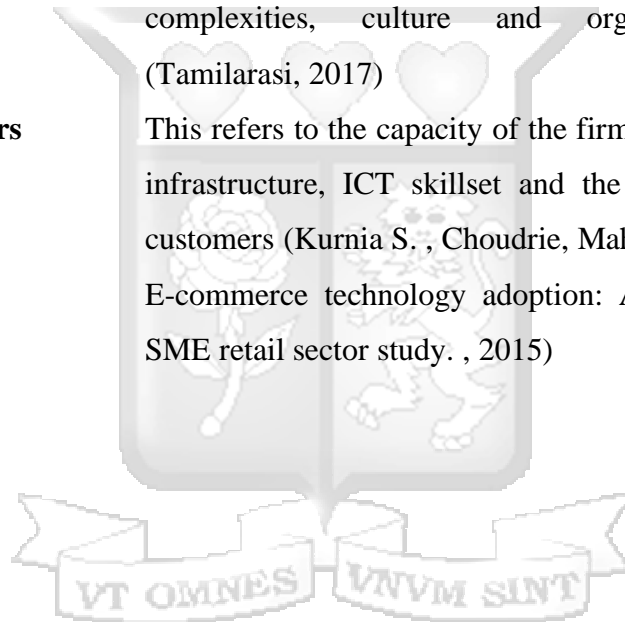
LIST OF ABBREVIATIONS AND ACRONYMS

CA	Communications Authority
CAGR	Compound Annual Growth Rate
EDI	Electronic Data Interchange
GUI	Graphical User Interface
HTML	Hypertext Mark-Up Language
ICT	Information Communication Technologies
IT	Information Technologies
OLS	Ordinary Least Squares
SME	Small and Medium Enterprises
USD	United States Dollar
VIF	Variance Inflation Factor
WWW	World Wide Web



OPERATIONAL DEFINITION OF TERMS

Adoption	This describes the acceptance of a new product or innovation in technology (Bhasker, 2017)
E-commerce	This alludes to the way toward selling and purchasing merchandise, administrations or data using PC systems including the web (Communications Authority of Kenya , 2018)
Environmental factors	This describes the internal and external environment in which an organization transacts its business (Laudon, 2014)
Organization factors	Describes the business such as scope, management competencies, size, centralization, formalization, complexities, culture and organization structure (Tamiliarasi, 2017)
Technological factors	This refers to the capacity of the firm to have the requisite infrastructure, ICT skillset and the IT readiness of the customers (Kurnia S. , Choudrie, Mahbubur, & Alzougool, E-commerce technology adoption: A Malaysian grocery SME retail sector study. , 2015)



CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The advent of technology has presented enormous opportunities and, at the same time, challenges for today's organizations by reshaping the relationships between consumers, businesses, suppliers, and in some cases, entire industries (Kabuba, 2014). Impacts of globalization expanded rivalry, the development of new advancements, and purchasers' push for expanded worth has constrained firms to make an incentive from restricted assets and competencies (Serravallo, 2015). Organizations in the commercial center are compelled to turn out to be progressively productive in asset use, highlighting on the slenderer association, and interminably develop creative new strategies to remain in front of contenders (Troacă & Bodislav, 2012). This has created a push and pull within firms as they seek to advance in adopting emerging technologies (Kalinić, Ranković, & Kalinić, 2016).

The availability and accessibility of the internet have led to the popularity of e-commerce, which describes any transactions conducted on the Internet. The earlier adoption of the internet can be traced to companies created on the web such as Amazon and eBay and have consistently grown to where small and medium enterprises (SMEs) are adopting this technology (Ocloo, Xuhua, Akaba, Addai, Worwui-Brown, Spio-Kwofie, 2018). The exceptional mastery of Information communication technologies (ICTs) over the most recent two decades has changed how individuals live and interface with one another and how associations lead their business (Wanjau, Macharia, & Ayodo, 2012). The Internet has introduced new business open doors for business people and customers to execute with their preferred stores (Kanyaru & Kyalo, 2015).

Organizations are endeavoring to expand their deals by selling items through the World Wide Web, characterized as an electronic business (web-based business). Web-based business is a methodology for quick development, particularly by small and medium-sized organizations (Grandón, Nasco, & Mykytyn, 2011). Electronic commerce adoption has expanded in the marketplace to the national and international market levels. It has allowed people and businesses to perform transactions at their convenience since it has reduced the cost of creating, retrieving paper information, and distribution costs (Shahjee, 2016). Electronic commerce is widely accepted because it reduces transaction costs between the trading parties instead of physical transacting (Kalinić, Ranković, & Kalinić, 2016).

E-commerce is a method of leading business exchanges over the web. The concept of e-commerce is a relatively new phenomenon in developing countries, and the idea can alter the traditional form of economic activities (Kamel & Hussein, 2013). The ever-changing technological landscape has aided E-commerce to become one of the most lucrative and fastest-growing business sectors within the information technology sphere (Tamilarasi, 2017). For instance, according to Statista, the United States and China's combined E-commerce sales reached 1.6 trillion United States dollars (USD) in 2017; cross-border E-commerce sales are set to achieve an average annual growth rate 25% through 2020 (Bhasker, 2017). From the same report, the Asia-Pacific E-commerce market is predicted to be twice the size of Western Europe and North America combined. By 2021 Global E-commerce sales are set to grow by a staggering 141% (Laudon, 2014).

Regionally, in Nigeria, and the adoption of E-commerce platforms in the Nigerian business environment indicated an increase since users of the internet had grown to almost 30% of its total population in 2010 from 0.9% in 2000. The country had the potential to grow higher (Adewoye, 2011). According to the Communications Authority of Kenya (2018), Kenya's electronic commerce market was estimated at around Ksh.4.3 billion in 2016. The internet penetration of about 88%, accounting for over 38 million internet users, has made Kenya be one of the most strategic African countries for digital commerce explosion. Companies are now adopting e-commerce by creating internet-based platforms to sell products and services. Gikandi and Bloor (2010) indicate that lack of resources, constant technologies, and lack of accessibility limited the adoption of new technologies in Kenya.

The logistics industry in Kenya has recognized the influence of e-commerce adoption on improving firm performance. E-commerce services have the potential to enhance a firm's effectiveness in exploiting available resources and capabilities to ensure superior employee and asset output, reduce costs, improve customer relationships and remain sustainable in the long-term (Molla & Licker, 2005). E-logistics supports automation, inventory management, and warehousing; these result in improved fleet management, thus enhancing end-to-end supply chain management (Amitrajit, 2013). Additionally, e-logistics provides for increased visibility, which improves the firm image, which has a long-term effect on sustainability (Hwang, 2002). However, some companies in the region are slow to adopt new technologies while other have struggled to properly integrate these technologies into their firm operations (Mutisya, 2016), hence it is important to understand the factors leading to the successful implementation of emerging technologies into logistics companies and their effect on service delivery.

This research was grounded on the technology association and condition structure Tornatzky and Fleischer (1990), which conceptualizes the critical indicators to the deployment of innovation within the firm and the innovation diffusion theory Rogers (2003), which identifies the motivating factors for the deployment of various innovation based on their benefits.

1.1.1 Technology Organization Environment Framework

With the rapid changes in technology and some of them being so disruptive, it is becoming more difficult for organizations all over the world to keep up, and by extension, take full advantage of it (Ndemo, 2015). Tornatzky, Fleischer, and Chakrabarti (1990) created the Technology Organization Environment (TOE) framework, which brings about three positions of an organization's perspective that impact the procedure by which it grasps and executes a mechanical advancement: innovative point of view, hierarchical viewpoint, and ecological point of view. Mechanical, hierarchical, and ecological elements impact the procedure by which an association receives and accepts a new technology (Awa, Ojiabo, & Orokor, 2017). The framework recommends that appropriation is affected by elements, for example, innovation advancement, hierarchical conditions, business and authoritative reconfiguration, and industry condition (Kurnia, Choudrie, Mahbubur, & Alzougool, 2015).

Wang, Li, Li, and Zhang (2016) adopted the TOE framework and indicates that the firm's size, technology competency, and critical mass are instrumental in mobile technologies adoption in the hospitality industry. Rowe, Truex, and Huynh (2012) note that e-commerce adoption is significantly influenced by the firm's numerous internal and external factors, as depicted in the TOE framework. Kurnia, Choudrie, Mahbubur, and Alzougool (2015), in analyzing e-commerce technology adoption, indicate that environmental pressure, organization readiness, industry factors, and technologies' availability are critical to the adoption process.

According to Agrawal, Agrawal, Singh, and Tripathi (2012), electronic commerce is composed of the trading products or services over a digital system like the internet or any other computer networks. Wunderlich, Grobler, Zimmermann, and Vennix (2014) indicate that various issues contribute to adopting new technology services. These factors could be technological, environmental, social, organization, and economical. Awa, Ojiabo, and Orokor (2017) indicate that the technology organization and environmental framework's taxonomies are statistically significant in predicting the integration of new technologies. Musawa and Wahab (2012) indicate that financial resources, technological resources, managerial capacity, and external pressure affect the adoption of e-commerce technologies.

1.1.1.1 Technological Factors

The technological perspective describes both the internal and external technologies essential to the organization, including current trends (Mohammed, Almsafir, & Alnaser, 2013). According to Colla and Lapoule (2012), the developed nations' pre-existing infrastructures allowed the internet and its related web-based technologies adoption within the business, which enhanced organization productivity.

Rahayu and Day (2015) found that technology readiness, the owner innovativeness, IT ability, IT experience, and adequate infrastructure affect eCommerce adoption in SMEs. Awiagah, Kang, and Lim (2016) posit that enabling the technology environment, the usefulness of the innovation, and managerial support influence the adoption of e-commerce. Al-Weshah and Al-Zubi (2012) indicate that the hindrances to internet business appropriation were hierarchical and specialized.

1.1.1.2 Organizational Factors

Organizational context is the terms that describe the business, such as scope, management competencies, size, centralization, formalization, complexities, culture, and organization structure (Awa & Ojiabo, 2016). Management of technology and innovations is hard and requires a risk-taking kind of management that will recognize the change in trends and will not miss the technology waves as it changes (Thong, Yap, & Raman, 2016). Management has to be alert and ensure they are at the forefront of identifying, understanding, and implementing innovations and technology changes (Igbaria & Tan, 2015).

Bultum (2014) indicates that lack of regulatory framework, lack of management support, ICT infrastructure, poor formalization, and structure limits the adoption of electronic banking in Ethiopia. Kanyaru and Kyalo (2015) found that organization support, adequate technical measures, and customer awareness impact web-based business reception. Mpofu and Watkins-Mathys (2012) show that SME's inability to receive online business is because of restricted assets whereby monetary, human, and innovative assets influence internet business selection.

1.1.1.3 Environmental Factors

The environmental perspective is the internal and external environment in which an organization transacts its business (Wang, Li, Li, & Zhang, 2016). Examples include its competitors, industry, and government regulations (Kurnia S. , Choudrie, Mahbubur, & Alzougool, 2015). Huy (2012) discovered a positive relationship between's internet business

selection and the supervisor's view of the force of rivalry, the backing of industry weight, provider and purchaser conduct, and part of business tasks.

Awiagah, Kang, and Lim (2016) indicate that government regulations, the cost of new technologies, and the speed of innovation affects the adoption of e-commerce technologies. Kanyaru and Kyalo (2015) indicate that internet penetration, customer awareness, network infrastructure, and government support are critical to adoption of e-commerce in developing countries. As per Ndyali (2013), technological boundaries are the most basic obstructions to web-based business, trailed by lawful and administrative hindrances.

1.1.2 Adoption of Ecommerce

E-commerce alludes to the utilization of correspondences innovation, especially the Internet, to purchase, sell, and market merchandise and enterprises to clients (Grandón, Nasco, & Mykytyn, 2011). As indicated by Kalinić, Ranković, and Kalinić (2016), web-based business is the deal or acquisition of merchandise or administrations led over PC systems by strategies explicitly structured to receive or place orders. Kurnia, Karnali, and Rahim (2015) describe e-commerce as a business strategy that offers services to encourage or execute selling administrations and items through the internet. E-commerce refers to business transactions in which the gatherings included connect electronically to trades data (Abdulghader, Ahmed, & Ibrahim, 2011).

The first generation of Electronic commerce (E-commerce) was made conceivable by improving electronic data interchange (EDI), the trading of business archives starting with one PC, then onto the next in a standard configuration, and is portrayed as the original of web-based business. EDI permitted organizations to trade data, place requests, and direct electronic subsidizes to move through machines (Tian & Stewart, 2006). The second era of web-based business is portrayed by the exchange of products and ventures through the Internet, which began as an exploration device. Nonetheless, it has, by and large, advanced into a business apparatus (Oliveira & Martins, 2010). It was the advancement of a graphical UI (GUI) and the safety of the World Wide Web that changed the idea of Internet use. In the mid-1990s, the making of the hypertext mark-up language (HTML), with determinations for uniform resource locators (URLs), empowered the web to advance into the condition that we know today (Naughton, 2016).

E-commerce has created many opportunities, and additionally, threats to companies, thus allowing rapid growth of markets with more precise market segments and the increase of

competitiveness within a specific industry (Mohammed, Almsafir, & Alnaser, 2013). Thulani et al. (2010), in Gweru, Zimbabwe, found that SMEs overwhelmingly use internet business applications for useful purposes and to cooperate electronically with providers and clients. This investigation analyzed how strategic firms depend on different web-based business applications in the activities of the firm. In the vehicle and coordination's industry, the upper hand is conveyed through the consistent joining of sources of info and yields, limited vacation, and snags to get a load to the necessary goal easily (Mohanty & Gahan, 2015). Legitimate arranging is fundamental to achievement in the coordination and transport industry. Utilizing gracefully fasten knowledge to recognize what to get ready for and integrate new e-commerce technologies is critical for improving firm performance (Amos, 2012).

Although some of the local firms, as shown in the studies above, adopting various utilization of ICT infrastructure, there has been limited exploitation of the vast e-commerce platforms, which can be integral to driving the competitiveness of logistics firms in Kenya. This study assessed the e-commerce adoption through digital integration (Amos, 2012), utilization of e-commerce platforms (Abdulghader, Ahmed, & Ibrahim, 2011), digital transformation processes (Mohanty & Gahan, 2015), improved market reach, and fostering efficiency and effectiveness (Mohammed, Almsafir, & Alnaser, 2013).

1.1.3 Logistics Firms in Kenya

The East African Logistics Performance survey (2012) uncovers huge improvement in port and transport productivity. Progressing changes and framework enhancements at the Kenyan port have yielded huge outcomes as freight stay time had dropped from a normal of 6.5 days in 2011 to 5 days in 2012. Ken-Research (2019) indicates that the coordination showcase has become because of Kenya's key area in the Great Lakes district, government spending on the part, and expanding volumes and estimation of remote exchange. The Logistics and Warehousing Market is Expected to Grow at a compound yearly development rate - CAGR of 11.7% during the period 2018-2023.

Mutisya (2016) posits that most logistics companies in Kenya, however, have not realized the need to employ technology in their delivery operation. Most logistics service providers have not aligned their strategies with the changes in information communication technology. The logistics industry in Kenya is growing very fast and is attracting more and more investors. The logistics industry contributes a lot to the economy of the country, and the key players in this market include the Postal Corporation of Kenya, international logistics companies, local logistics companies, Security firms and bus companies (Kariuki, 2019).

There is a rising global demand for automation and cost-efficient material handling systems such as conveyor systems, driven by the warehouse and distribution technologies within the logistics industry (Koskei, 2016). However, there has been limited execution of technology innovation within the logistics sector in the country as a result of poor execution of internal and organizational environment factors (Kanyaru & Kyalo, 2015). Research and Markets (2019) indicates that the massive initial investments needed to incorporate the systems have restricted medium and small companies from integrating the e-commerce systems within the logistics industry in Kenya. This study sought to establish how the complexities in the logistics industry impact e-commerce adoption as guided by the technology, organization, and environmental framework. According to the Kenya International Freight and Warehousing Association (2018), there are 868 firms within the industry

1.2 Statement of the Problem

Businesses currently leverage the ability to adapt and utilize ICT innovatively to promote their entrepreneurial performance. In Kenya, the 2016 MSME survey revealed that seventy-seven percent of MSME owners reported having a mobile phone (Malenya, 2017). Providing ready-made logistics solutions is expected to stimulate growth within the Kenyan logistics firms. However, evidence has indicated that most of the local logistics firms have been unable to leverage the available e-commerce solutions in expanding their business offering (Mutisya, 2016). This has resulted in most of the local logistics firms losing their competitive edge to global multinational logistics firms that have extensively deployed e-commerce in their service provision. Kitukutha and Oláh (2018) noted that the integration of new technologies has resulted in new challenges with concerns being raised on the protection of private information and increased fraud within online channels, impacting efforts to improve e-logistics services. Macharia, Iravo, Ondabu, and Ombui (2015) reaffirmed this and argued that a lack of extensive integration of ICT has significantly influenced service delivery within logistic firms in Kenya. This has resulted in the significant international logistics firms setting up shop in Kenya to fill the gap in the delivery of optimal logistics services. Copia Kenya has embraced the strategy of integrating e-commerce within its logistics branch, and this has resulted in improving its distribution network, which can now access rural areas in the countryside (Kariuki, 2019). While there has been increased access to internet and technology implementation by various sectors, the logistics industry has been slow in this uptake, and there seems to be limited adoption of technologies for processing of their services remotely, with few companies implementing logistics systems (Mutisya, 2016). Thus, there is a requirement for a basic

appraisal of what variables are prompting the moderate selection of online business inside the coordination's business. Accordingly, this examination tried to build up the degree to which technology, organization, and environmental factors affect e-commerce adoption.

Various studies have been conducted examining the determinants and issues impacting e-commerce adoption. Ajao, Oyebisi, and Aderemi (2018) examined the factors affecting the usage of online business advancements and concluded that staff ICT background, e-readiness of the customer, technological factors, and government policies were vital barriers. Tsuma and Kanda (2017) examined the factors affecting the adoption of e-Procurement Systems and notes that organization factors, adoption of technology, and strategic factors influence e-procurement implementation in Kenya. Koech, Ayoyi, and Mugambi (2016) studied the factors influencing the adoption of e-procurement and indicates legal issues, resistance to change, IT issues, and security concerns affect adoption. The above studies have, however, been conducted in both the public sector and in the SME sector; however, there seem to be limited studies examining factors contributing to the successful adoption of e-commerce practices within small and medium logistics companies that operate in developing countries (Iskandar & Ramantoko, 2018). This study was motivated to fill this empirical gap and expand the knowledge on the factors influencing the adoption of e-commerce in the logistics industry in Kenya, which is a significant concern to practitioners in the industry. Such findings will help establish the influence of technology organizational environment framework on the adoption of e-commerce in logistic firms.

1.3 Objectives of the Study

The main objective of this study was to determine the effect of the technology organization environment framework on the adoption of e-commerce in logistics firms in Nairobi County

1.3.1 Specific Objectives

- i. To establish the effect of technical factors on the adoption of e-commerce in logistics firms in Nairobi County
- ii. To establish the effect of organizational factors on the adoption of e-commerce in logistics firms in Nairobi County
- iii. To establish the effect of environmental factors on the adoption of e-commerce in logistics firms in Nairobi County

1.4 Research Questions

- i. What is the effect of technology factors on the adoption of e-commerce in logistics firms in Nairobi County?
- ii. What is the effect of organizational factors on the adoption of e-commerce in logistics firms in Nairobi County?
- iii. What is the effect of environmental factors on the adoption of e-commerce in logistics firms in Nairobi County?

1.5 Scope of the Study

The geographical scope of this study focused on the logistics firms operating within Nairobi County. The conceptual scope of the investigation concentrated on the assessment of the impact of the innovation factors, association factors, and ecological components on the selection of e-commerce. The theoretical scope of this study was grounded on the innovation diffusion theory. The methodological scope of this study was based on a quantitative approach with structured instruments being utilized in the research. The study examined the adoption of e-commerce within the logistics firms as between April 2020 to June 2020.

1.6 Significance of the Study

The research is expected to have both policies, research, and practical implications within the logistics industry in Kenya. To the management team of the logistics firms, the results of this study were vital in guiding the firms in implementing e-commerce based on the TOE framework. The findings will also be vital in streamlining the decision making and review of the various guidelines for the adoption of e-commerce within the firms.

To the policymakers within the logistics industry, the results can be utilized in building capacity among the stakeholders within the industry on the benefits of e-commerce adoption. Further, the findings of the research will help amplify policymakers in formulating new guidelines that can be adopted by logistic firms in planning for eCommerce adoption. Furthermore, the study findings can be utilized by policymakers as a marketing tool showcasing how the Kenyan market has supported eCommerce adoption within logistic firms, which can act as a channel for future foreign investments.

The findings will help in expanding the available knowledge on how the technology factors, organizational factors, and environmental factors influence eCommerce adoption. Scholars who wish to extend the research on this area of study will use research as a reference point.

The study will show the relevance and reveals the benefits of adopting e-commerce in the logistics industry for a developing country like Kenya.



CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter discusses and presents a critical review of the literature associated with the study variables. It starts with a review of various theories on which the study is anchored, followed by a review of empirical studies and a presentation of the various research gaps motivating this research. The chapter further presents the conceptual framework, operationalization of study variables and ends with a chapter summary.

2.2 Theoretical Review

Theories are planned to clarify, anticipate, and get marvels and, much of the time, to challenge and expand existing information. The hypothetical system is the structure that can hold a hypothesis of an exploratory study and guide the whole examination. In this manner, the hypothetical structure is nevertheless a hypothesis that fills in as a reason for leading exploration. (Khan, 2015). The study was guided by the innovation diffusion theory.

2.2.1 Diffusion of Innovation Theory

The diffusion of innovation theory was advanced by Rogers (1995) and is vital in explaining the need for firms to adopt technologies and the flow of IT innovation in the social system. It mainly encompasses three views; that diffusion involves the systematic transfer of information through various digital channels within an organization; that adoption involves decision making on the best course of plan to approach to ensure the optimum approach is made and that innovation is an idea which could improve firm competencies (Rogers, 1995). The theory argues that innovation is considered as a new idea which is aimed at changing the way operations are carried out in the firm. It is through the diffusion process that a given form of innovation flows and gets spread within the social system (Rogers, 2003).

The diffusion of innovation theory further highlights key attributes that influence the successful spread of IT innovations. These attributes include observability, trialability, complexities, compatible as well as the relative advantage of the system. Relative advantage is the extent that a new concept or an idea is considered to be more exceptional as compared to the superseded idea (Dodgson & Salter, 2005). Compatibility is a feature that indicates how a given innovation is in line with the values of the firm. Complexity is the degree to which a given form of innovation is believed to be too challenging in understanding as well as use. Trialability is the extent to which an innovation can be tried up or rather, experimented on a bounded scale.

Finally, observability is the extent to which innovation outcomes and aftereffects are noticeable and perceivable to other people (Rogers, 2003).

IT innovations tend to diffuse more rapidly and extensively when users have positive perceptions that it is better off and aligned with the overall values (Rogers, 2003). It is for this reason that Dodgson and Salter (2003) idealizes that before IT innovations can fully take shape in a market, their inputs and outputs should be seen to be measurable and satisfactory to the users. Besides, IT innovation should be relatively easy to use and thus be able to attract users. This means that IT innovations must have benefits for them to be successfully adopted by their intended users.

The diffusion of innovation theory is relevant and pertinent to this research as it explains the process of diffusion of IT innovations in a business set up. It is also important in providing the opportunity for the researcher to re-evaluate the thinking behind every decision prior to the adoption of technology. Henderson and Divett (2003) reveal that IT innovations result in improved versions of products and services, which are cost-effective, thus improving firm performance. The theory allows for analysis of the technology adoption process and the role played by different actors in ensuring the effective integration of e-commerce practices within organizations. This theory thus helped in explaining the nature of the adoption of e-commerce within Logistics firms in Kenya.

2.2.2 The Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was created by Davis, Bagozzi, and Warshaw (1989) to clarify the components that impact a person's reception and acknowledgment of the innovation. It gives a helpful establishment to understand the variables that drive innovation acknowledgment. It has, accordingly, been one of the most broadly embraced hypothetical systems in understanding client acknowledgment of innovation (Bagozzi, 2007).

The TAM came from Ajzen and Fishbein's (1980). As indicated by the TAM, saw helpfulness, and saw the convenience of the innovation being referred to are theorized to be major determinants of client acknowledgment. The TAM places that clients' genuine or social acknowledgment is essentially dictated by conduct expectations to utilize the innovation being referred to. Social expectations are, thusly, affected by the client's demeanor towards innovation. Davis et al. (1989) keep up that apparent convenience and saw usability are convictions that lead to great mentalities and expectations to acknowledge and utilize innovation.

Even though the TAM has been condemned for having pulled in plenty of adjustments and expansions, which will, in general, recommend that the model is insufficient to clarify innovation acknowledgment in many exploration setting (Bagozzi, 2007), it keeps on being experimentally demonstrated for its capacity to foresee about 40% of framework use (Legris, Ingham and Collarette, 2004). It has gotten acclaim for its miserliness and prescient controls throughout the years. Further, it has received criticism that it mainly ignores the opinion of the customer by focusing on how the firm perceives a technology is useful and easy to use. However, its focus on perceived usefulness is instrumental since it shapes the thinking behind the adoption of new technology. This theory is useful in this study since it lays a foundation for the researcher to understand how underlying external variables influence decision making in regards to the type of technology that a firm will adopt. The TAM, along these lines, could turn into a fundamental reference hypothesis in seeing how the different elements add to the reception of e-commerce within Logistics firms in Kenya.

2.3 Empirical Review

This section reviews various contemplates that have been embraced on the different investigations on online business appropriation. The investigation expects to set up if the innovation, association, and condition impact internet business selection.

2.3.1 E-commerce practices and ICT Adoption

Advances in technology have seen access to internet broadband, clearing the way for modernization of business practices around the world (Hajli, 2014). E-commerce involves the use of online services to carry out business transactions, starting with contact and ending with the delivery of a good or service (Mutua, Oteyo, & Njeru, 2013), and it comprises all aspects of online marketing, online ordering, e-payment, online distribution, and all after-sale services. E-commerce has been noted to increase a company's reach in the market by allowing new ventures to be explored and by enhancing operational efficiency (Liu, Zhang, Wei, & Wang, 2020). Further, it enhances relationships between businesses and between businesses and their customers (Hajli, 2014). The ubiquity of the internet means that businesses have access to markets that exist beyond the physical location via a variety of means such as video conferencing, audio and text messaging, single customer marketing, allowing for increased cost-efficient interactivity. Further, it allows for the personalization of marketing messages improving the quality of traditional advertisements (Okadapau, 2016).

E-commerce practices comprise collaborative commerce involving electronic information sharing between business partners (Wiley, 2015), business to business involving financial

engagements between different business parties such as retailer and wholesaler (Chong et al., 2011), business to customer and vice-versa, involving the customer and the business (Koufaris, Kambil, & Labarbera, 2001), customer-to-customer where customers use a platform to sell goods and services (Du, Yu, Fang, & Wang, 2012) and government to citizens and government to government through e-commerce technologies (Evans & Yen, 2005). The adoption of a particular technology is influenced by the needs of the organization and the existing technologies, meaning that it is necessary to carry out an internal assessment of the firm before determining the type of technology that a company would adopt in its day-to-day operations (Cater-Steel & Grist, 2004). The TOE framework has been used with other models to predict technology adoption behavior in both large-scale and low-scale businesses. It focuses on the role that the existing technologies, firm characteristics, and environmental factors influence technological adoption among multiple firms.

2.3.2 Technological Factors and Adoption of Ecommerce

Alwan and Al-Zubi (2016) conducted a study to find out the determinants of internet banking uptake by clients of commercial banks in Jordan and the obstacles preventing its growth. The study used a sample of 476 customers of 13 commercial banks who were using internet banking. The results show that the banks that used Internet banking had a higher profit than non-users of the service. Small banks that concentrated on online banking services costed less than those that did not use the service. The study also found out that the website quality, perceived privacy, customer trust, perceived ease of use, and security had significant effects on internet banking uptake. The number one indicator of the uptake was the website quality, followed by customer confidence. The research focused on commercial banks in Jordan. In contrast, the current study focuses on how the TOE framework influences the adoption of e-commerce in Kenya.

Vitorino, Filho, and Moori (2018) focused on Brazilian firms to determine the connection between technological innovation and competitive positioning. The design adopted was descriptive. It was shown that technological innovation capabilities enhanced the competitive advantage of the companies as it gave them learning capability, market capability, resource allocation capability, manufacturing capability, and strategic planning capability. The study recommended that companies need to adopt information technology as it is a crucial factor for a business firm seeking to have a profitable success in its industrial sector of operation. The research, however, fails to examine the factors that are key to the adoption of e-commerce within the firms.

Rahayu and Day (2015) focused on the determinant factors of e-commerce adoption by SMEs in Indonesia. The research adopted the TOE framework to examine the adoption within 292 SMEs. The study utilized a mix of quantitative analysis techniques. The findings indicate that the perceived benefit, technological readiness, the owner's innovativeness, IT ability, and their owner's IT experience were crucial for adopting eCommerce within the firms. The study was focused on SMEs in general, while this study examines logistics firm's adoption of e-commerce.

Mekasha (2015) studied the technology adoption of Ethiopian manufacturing firms. The study adopted a survey research design focusing on the textile and leather sector. The study utilized structured research questionnaires with quantitative analysis being adopted. The results reveal that firm size, certification, competition, employee technical skill, financial resources, and government support are significant predictors of technology adoption. The study also notes that top management commitment and the age of the firm did not significantly predict technology adoption. The research was, however, not limited to the logistics firms, which is the focus of this study.

Nigussie (2019) examined the factors affecting the adoption of e-commerce in tour operators in Ethiopia. The study focused on 217 tour operator firms and relied on quantitative data analysis. The study indicates that market e-readiness, IT capability, perceived benefit, supporting industries, organizational competency, government e-readiness, perceived compatibility, top management support, and perceived complexity influence e-commerce adoption. The study notes that collectively 88.6% variations in the adoption of e-commerce were determined by technology-centered factors. The study results, however, cannot be generalized to the current research context.

Mutua, Oteyo, and Njeru (2013), conducted a study to find out the extent of e-commerce penetration among SMEs in Nairobi, Kenya. The research methodology used for the study was a cross-sectional survey. The study found out that as much as e-commerce happened to give companies strategic value, it was not widespread, and most SMEs in Nairobi had not adopted the technology. 43% of the organizations sampled did not have functioning websites. Findings further indicate that the main issues found to influence adoption were the perceived high budget of achieving e-commerce technologies, knowledge degradation in terms of e-commerce, security concerns amongst the online community. The study focused on SMEs' within Nairobi County, while the current study focuses on logistics firm's adoption of e-commerce.

Njoroge and Kabare (2016) researched the job of the armada the executives on flexibly chain execution in coordination firms based in the Nairobi Industrial Area, Kenya. A cross-sectional survey research design was used. The study targeted 20 logistics firms in the industrial area. Simple random sampling was were used to select 65 respondents. It was recommended that logistic firms should invest heavily in ICT, such as; establishment of locally available vehicle correspondence frameworks, vehicle wellbeing innovation, and armada the executive's frameworks. The examination neglects to look at how different components influence the adoption of e-commerce within logistic firms.

2.3.3 Organization Factors and Adoption of Ecommerce

According to Wang and Howell (2012), the changing hierarchical procedures and methods for business improvement depend on administration. Accordingly, transformational pioneers have such characteristics that can prompt the change of associations from business as usual to the ideal state. As per Lo, Ramayah, Cyril, and Run (2010), the utilization of ICT-based application bundles in stock control, propelled venture the board, and booking frameworks are inadequate in numerous organizations, and this is ascribed to that reluctance of association administrators to mechanize their associations fully.

Herzallah and Mukhtar (2015) focused on organization information ecology and e-commerce adoption. The study adopted a desk-top review of the literature and indicates that organization and technological factors are significant predictors of e-commerce adoption. The study indicates that business formalization, implementation of the elaborate structure, and communication are fundamental to adoption. The study, however, did not leverage on primary research data. In another research paper, Herzallah and Mukhtar (2015) conducted a study on the impact of internal organization factors on the adoption of e-commerce among Palestinian small and medium enterprises. The researchers note that organization structure, information culture, technological capability, and internal processes were critical to the adoption of e-commerce. The study, however, fails to look at how environmental factors influence the adoption of e-commerce.

Awiagah, Kang, and Lim (2016) examined the factors influencing online business appropriation among SMEs in Ghana. The examination utilized an overview research plan with basic condition demonstrating was used in the information investigation. The consequences of the research indicate that managerial support, enabling regulatory conditions, and government support have a positive impact on e-commerce adoption. The study further notes that creating

an enabling internal environment is integral to supporting e-commerce adoption. The study was, however, not focused on logistics firms in Kenya. Nega (2019) studied the determining factors affecting the adoption of e-commerce in the perspectives of Ethiopian Banks. The study adopted a mix of qualitative and quantitative research design. The significant findings of this study indicate that IT capability, perceived benefits, supporting services, and government support have a statistically significant influence on the adoption of e-commerce. The study focuses on commercial banks, while this study examines the logistical firm's e-commerce adoption.

Maragia (2016) studied E-commerce adoption by insurance agencies in Kenya. The examination embraced an elucidating research structure with the number of inhabitants in the investigation selected from the 50 registered insurance firms. The results show that technological factors, organizational factors, and natural factors all have an effect on the pace of reception of web-based business among protection firms in Kenya. The representative's mechanical ability assumes an indispensable job in guaranteeing brisk selection of online business by insurance agencies, the association's capital base, the association culture, and the board's apparent thoughts on a given innovation was also influential towards technology adoption. The study focuses on insurance firms while this study examines the e-commerce adoption of logistic firms in Kenya.

Gathu (2017) investigated small and micro enterprises (SMEs) adoption of ICT for competitive advantage. The study acknowledged that as a result of increased competition in the global market, most businesses had adopted ICT as a catalyst to help them innovate on their businesses for them to remain relevant and enjoy the benefits that come with innovations. The type of design adopted was descriptive, and the analysis was carried out descriptively. The findings revealed that most SMEs in Nairobi County had not adopted ICT in their innovations. Most innovations of new products were manual, and the new products did not translate to increased sales as there was no sufficient marketing online, which can be done well by incorporating ICT. The study recommended the need for SMEs to build internal competencies in the use of ICT. The study failed to examine how environment and technology factors can be critical to the adoption of e-commerce within logistic firms in Kenya.

2.3.4 Environmental Factors and Adoption of Ecommerce

Kurnia, Choudrie, Mahbubur, & Alzougool (2015) conducted a study to determine the challenges faced by the Malaysian grocery SME retail sector while adopting e-commerce

technology. The target population retail was the Malaysian grocery segment SMEs. They used a quantitative survey to conduct the research. Findings indicate that there was a significant impact of environmental pressure on the embracing of various e-commerce technologies, and the impact of industry readiness was insignificant. This research, however, focuses on the Malaysian SME sector while the current study examines firms in Kenya.

Nugroho (2015) completed an examination to assess the impact of the help of government and contender pressure on the enthusiasm of Indonesian SMEs in embracing information technology. The study had a sample size of 446 SMEs in Yogyakarta. A simple random sampling technique was used to do sampling. Data were analyzed through the Partial Least Square (PLS) approach. The findings of the research were that the pressure from competitors and the support by the government did not significantly affect technology readiness. The study also indicates that industry readiness has been a significant predictor of technology adoption. The study, however, fails to focus on how technology and organization factors influence e-commerce adoption.

Tefera-Tekle (2017) examined the adoption of the e-commerce framework for Ethiopian Banks. The study adopted a survey research design with quantitative analysis being utilized in the research. The results indicate that enhancing the working environment by supporting better interoperability in the infrastructure and reviewing regulatory policies was key to improving e-commerce adoption. The study notes that improvement in the legislation and rollout of digital infrastructure is key to improved infrastructure. The study, however, focuses on the commercial bank industry while this study examines logistic industry firms. Nantembelele and Gopal (2018) assessed the challenges of e-commerce adoption in Tanzania. The study sampled 100 managers in the data collection. The results indicate that spending imperatives, helpless Internet infiltration, a low degree of PC proficiency, and an absence of abilities and preparing were the noteworthy boundaries to web-based business innovation appropriation. The examination, however, fails to examine the applicability of the TOE framework in e-commerce adoption.

Koskei (2016) conducted a study on the vital arrangement and data innovation on the presentation of east African Portland Cement Company Ltd. in Kenya. The study embraced a case study research design and descriptive statistics for scrutiny and inquiry. The study revealed that alignment of the organization's interior and outer techniques with its IT stage gives the association an upper hand if just there is sufficient checking of the company's present-

day working condition and distinguishing the dangers and openings that exist in the market. The investigation suggested that associations should think of a top-down arrangement that includes all representatives in the usage of a similar system. The study focuses on the contribution of information technology to the performance of the firm. In contrast, the current study examines how TOE influences the adoption of e-commerce.

Ajowi and Reuben (2019) examined the innovative, authoritative, and ecological variables on the selection of distributed computing in insurance industries in Kenya. The study employed a descriptive research design, with 215 participants being selected for the research. The results showed that ecological variables impact selection to distributed computing at UAP-Old mutual. The study notes that industry competition, strategic alliances with partners, and regulatory factors are crucial to the adoption of cloud computing. The study focuses on insurance firms, while the current study examined logistics firms in Nairobi.

2.4 Summary of Literature and Research Gaps

The study reviewed various empirical studies that were structured in line with the study objectives. The study by Nantembelele and Gopal (2018) focused on the challenges for eCommerce adoption but was not focussed on the Kenyan logistics industry, which was the focus of the current research. Further, the study did not examine how the TOE framework influences eCommerce adoption. Nigussie (2019) researcher on eCommerce adoption in Tour firms operating in Ethiopia; hence the study findings cannot be generalized in the current research context, which examined eCommerce adoption within logistic firms in Kenya. Gathu (2017), in a study in Kenya, found out that ICT adoption had a strong influence on the competitive advantage of SME firms. The current research, however, sought to determine how TOE influences e-commerce adoption in logistics firms in Kenya. The various summary of research gaps is presented in the table below.

Table 2.1 Summary of Research Gaps

Author	Title	Findings	Research Gap
Ajowi and Reuben (2019)	TOE factors on the adoption of cloud computing in insurance industries in Kenya	Industry competition, strategic alliances with partners, and regulatory factors are key to the adoption of cloud computing	The study focuses on insurance firms, while the current study examines logistics firms in Nairobi.

Awiagah, Kang, and Lim (2016)	Factors affecting e-commerce adoption among SMEs in Ghana	Creating an enabling internal environment is integral to supporting e-commerce adoption	The study was, however, not focused on logistics firms in Kenya
Herzallah and Mukhtar (2015)	Impact of internal organization factors on the adoption of e-commerce	Organization structure, information culture, technological capability, and internal processes were vital to the adoption of e-commerce	The study, however, failed to look at how environmental factors influence the adoption of e-commerce
Nigussie (2019)	Factors affecting the adoption of e-commerce in tour operators Ethiopia	Organizational competency, top management support in influence e-commerce adoption	The study results, however, cannot be generalized to the current research context focusing on logistics firms in Kenya
Vitorino, Filho, and Moori (2018)	Determine the connection between technological innovation and competitive positioning	Technological innovation capabilities enhanced the competitive advantage of the companies	The research, however, fails to examine the factors that are key to the adoption of e-commerce within the firms.

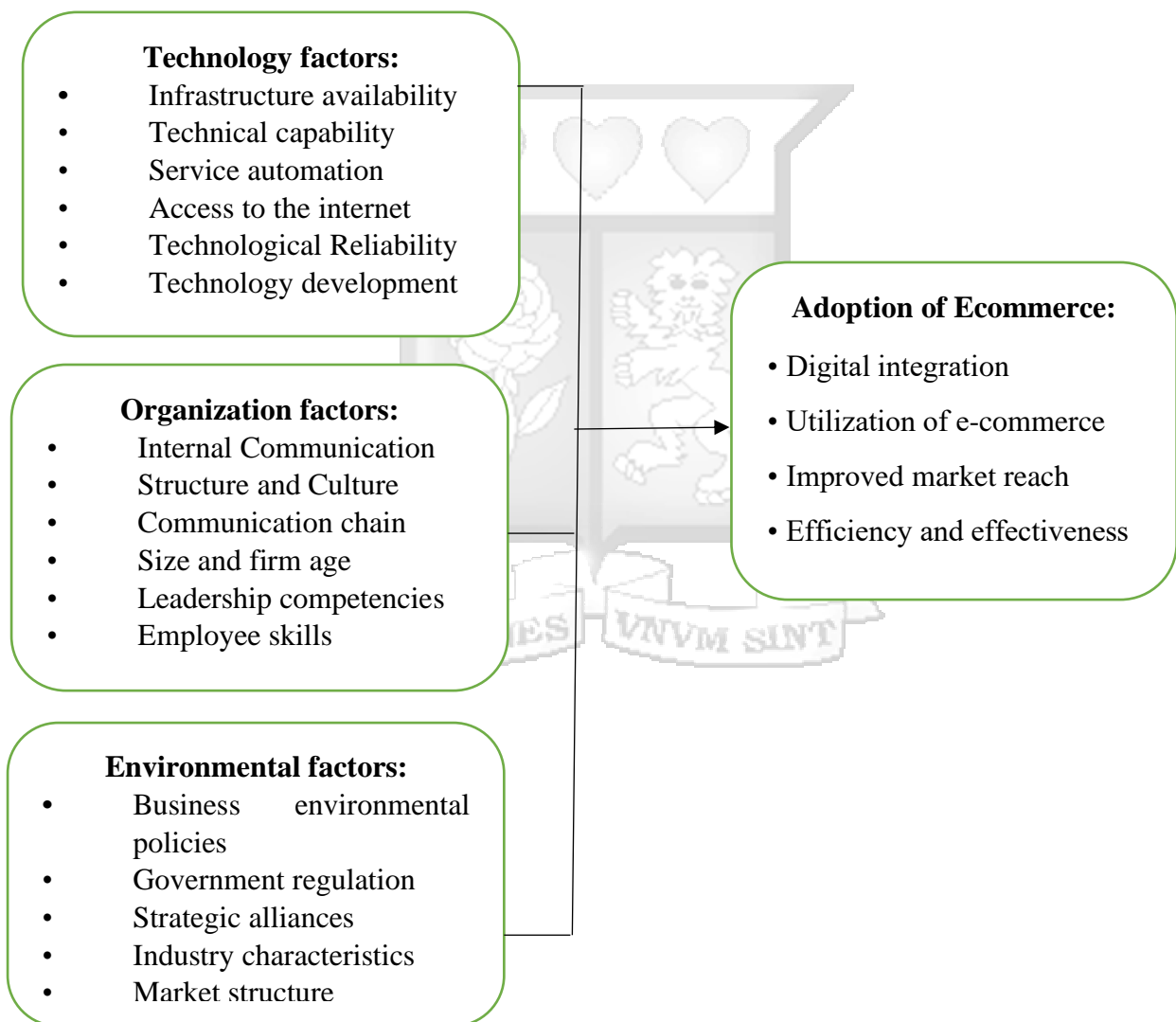
Source: Author (2020)

2.5 Conceptual Framework

The conceptual framework is a pictorial representation of the study variables and how they interrelate with each other in the study (Creswell, 2015). The essence of the conceptual research framework in figure 2.1 is to show the link between TOE and e-commerce adoption within logistic firms in Kenya.

Figure 2.1 Conceptual Framework
Independent Variables

Dependent Variable



Source: Author (2020)

The framework above identifies the interaction between the independent variables and the dependent variables of the study. The framework is operationalized, as shown in Table 2.2 below.

Table 2.2 Operationalization of Research Variables

Variable	Indicators	Data collection tool	Data analysis	Supporting Literature
Technology factors	<ul style="list-style-type: none"> • Infrastructure availability • Technical capability • Service automation • Access to the internet • Technological Reliability • Technology development 	Structured questionnaire 5-point Likert scale	Descriptive analysis and inferential analysis	Vitorino, Filho, and Mouri (2018), Rahayu and Day (2015), Mutua, Oteyo, and Njeru, (2013)
Organization factors	<ul style="list-style-type: none"> • Internal Communication • Structure and Culture • Communication chain • Size and firm age • Leadership competencies • Employee skills 	Structured questionnaire 5-point Likert scale	Descriptive analysis and inferential analysis	Herzallah and Mukhtar (2015), Awiagah, Kang, and Lim (2016), Maragia (2016)

Environmental factors	<ul style="list-style-type: none"> • Business environmental policies • Government regulation • Strategic alliances • Industry characteristics • Market structure 	Structured questionnaire 5-point Likert scale	Descriptive analysis and inferential analysis	Nugroho (2015), Nugroho (2015), Ajowi and Reuben (2019)
E-commerce adoption	<ul style="list-style-type: none"> • Digital integration • Utilization of e-commerce • Improved market reach • Efficiency and effectiveness • Digital transformation processes 	Structured questionnaire 5-point Likert scale	Descriptive analysis and inferential analysis	Abdulghader, (Amos, 2012) (Abdulghader, Ahmed, & Ibrahim, 2011); (Mohanty & Gahan, 2015), (Mohammed, Almsafir, & Alnaser, 2013)

Source: Author (2020)

2.6 Chapter Summary

The review of the study literature indicates that the integration of various components of e-commerce is critical to organizations. The theoretical review of the TOE framework indicates that the technological, organization, and environmental factors are essential in directing e-commerce adoption within firms. The study relied on the diffusion of innovation theory and technology acceptance model in examining the factors influencing e-commerce adoption within the logistic firms in Kenya. The study further has reviewed several studies that have helped identify the various empirical gaps and methodological gaps that were utilized towards solving the research problem.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter focuses on the rationale and the methodology employed in the course of the research. The chapter highlights the research philosophy, the research design, the population of the study, the sampling design, and data collection instruments to be utilized. The chapter further presents the data collection instruments that were employed, the research quality, as well as the data analysis and presentation methods used.

3.2 Research Philosophy

Research philosophy is majorly divided into three: epistemology, ontology, and axiology (Lewis-Beck, Bryman, & Liao, 2003). These parameters influence the way research is undertaken from design to conclusion. This study adopted a pragmatic philosophy: the research objective and questions were determined, the research designs, methods, measuring instruments, and ultimately the outcome of this research work (Scholtens & Kang, 2013). The philosophy allowed the study to utilize a quantitative approach in the course of examining the link between the study variables.

3.2.1 Research Design

According to Creswell (2014), a research design is plans and techniques for research that range the choices from expansive suppositions to explicit strategies for information assortment and examination. This study employed a descriptive survey research design. The descriptive survey design was appropriate for this study since it facilitated the proper description of the variables under review (Creswell, 2015). The design was appropriate for the study since it allowed for the collection of information for independent and dependent variables using a structured questionnaire.

3.3 Population and Sampling Techniques

3.3.1 Target Population

Creswell (2015) defined a population as a group of events, people, or items of interest with a common observable attribute. Kothari (2012), depicted a populace as the arrangement of testing units or cases that the scientist is keen on. The populace for this investigation was drawn from the registered logistics firms within Nairobi County. According to the Kenya International Freight and Warehousing Association (2018), there were 868 firms within the industry as of December 2018. At least over 55% of the firms have their main offices and

representative stations within Nairobi County. The population of the study was thus 477 firms with a presence within Nairobi County. The unit of observation was the managers of the firms in the logistics industry within Nairobi County.

3.3.2 Sampling Design

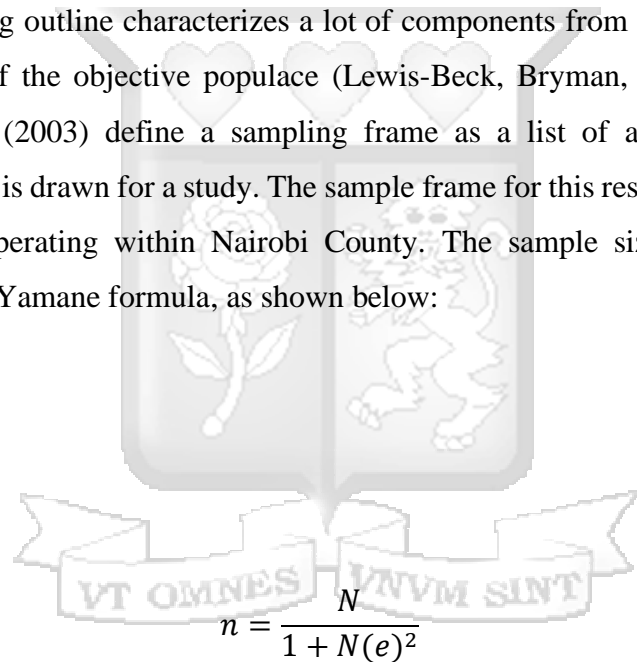
According to Johnson and Turner (2003), sampling design is the strategy or methodology the scientist would receive in choosing things for the example. This section describes how the sample size for the study was determined and the procedure that was used to identify sample subjects. The study adopted a non-probability sampling technique in selecting logistics firms in Kenya operating within Nairobi County.

The sampling frame is a rundown or other gadget used to characterize a specialist's populace of intrigue. The testing outline characterizes a lot of components from which a specialist can choose an example of the objective populace (Lewis-Beck, Bryman, & Liao, 2003). Also, Johnson and Turner (2003) define a sampling frame as a list of all the items where a representative sample is drawn for a study. The sample frame for this research was drawn from the logistics firms operating within Nairobi County. The sample size for the study was determined using the Yamane formula, as shown below:

n =sample size,

N = population size

e =level of precision.



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

$$217 = \frac{477}{1 + 477 (0.05)^2}$$

The sample size for this research was the managers of the 217 logistics firms operating within Nairobi County. To select the 217 firms random sampling method was used, whereas in selecting the managers who responded to the survey, judgemental sampling was used in selecting them. This was employed so that the researcher could get information from the right personnel within the logistic firms in operation.

3.4 Data Collection Instruments and Methods

The primary data for the research was collected using structured questionnaires. The instruments for data collection choice are crucial to the success of the research. It is, therefore, essential for the researcher to take into consideration the type of the topic, response rate, time, and the targeted population (Creswell, 2014). Kothari (2012) defines a questionnaire as a document that consists of several questions printed or typed in a definite order on a form or set of forms. This study relied on a structured research questionnaire. The first part of the questionnaire captured demographic information. Part B captured the response for the technology, organizational, and environment variables, and Part C, the questions about the eCommerce adoption variable of the study.

3.5 Data Collection Procedures

Johnson and Turner (2003) posit that data collection is the accurate means to systematically gather and extract vital data from all the significant sources to discover answers to the examination issue, test the theory and assess the results. The study relied on a drop and picked method in the data collection process, as this enhances the convenience and efficiency in the data collection process. The study booked interviews with the study participants before initiating the data collection process to ensure that they are accessible for participation in this study. This was enhanced by utilizing Google forms to foster the speed of data collection. The study ensured that all relevant approvals from the Ethics Review Committee and NACOSTI are obtained before undertaking the research work. The study further ensured that all the study participants' consent is sought before being involved in the research. To increase participation willingness to participate in the study was affirmed through ensuring the anonymity of the participants is assured.

3.6 Research Quality

According to Kothari (2012), a successful pilot study uses 1% to 10 % of the actual sample size. The research instrument was pretested using a sample of 10% of the actual sample size. The study undertook the pretest to allow for both reliability and validity tests to be conducted for the research instrument. The firms targeted for the pilot study were excluded from the main study. The study conducted a pilot test among 14 managers selected from logistic firms within Embakasi Container Depot.

3.6.1 Reliability of Research Instrument

Reliability is a measure of the degree to which instruments yield consistent results or data after repeated trials (Creswell, 2014). The reliability of the pilot study was carried out using 10% of the population not considered for primary research. Cronbach alpha coefficient, which is used to assess the internal consistency among research instruments items, was used. Cronbach Alpha coefficient equals zero when the correct score is not measured at all, and there is only an error component. Alpha equals 1.0 when all items measure only the actual score, and there is no error component. If the values are too low, either too few items are used, or the items had little in common (Kothari, 2012).

Table 3.1 Reliability Results

Variable	Cronbach's Alpha	N of Items
Technology factors	.845	5
Organizational factors	.715	7
Environment factors	.770	5
Ecommerce adoption	.820	6

Source: Author (2020)

The study conducted a pretest with 10% of the sample respondents (n=21). The results of the pilot study indicated that; technology factors ($\alpha = .845$), organization factors ($\alpha = .715$), environment factors ($\alpha = .770$) and the e-commerce adoption ($\alpha = .820$). The study adopted all constructs with an alpha score of above 0.7

3.6.2 Validity of Research Instrument

Validity is the ability of the research instrument to measure what is supposed to measure (Gujarati & Forter, 2010). There are various types of validity, including construct, content, face, and criteria related validity (Creswell, 2015). The research study used both content, face, and construct validities. Content validity was observed by the questionnaire being examined by the research supervisor for completeness. Construct validity was observed by dividing the questionnaire into several parts, which had information for a specific objective and ensuring that it is constructed in tandem with the conceptual framework. The study further employed face validity by subjecting the questionnaire to managers of the firms selected for the pilot tests whose responses were used to refine the questions further to allow for the main study.

3.7 Data Analysis and Presentations

3.7.1 Diagnostic Tests

This study undertook linear regression analysis in determining the relationship between technology, organization, and environmental factors influencing the adoption of e-commerce. This study, however, undertook linear regression assumptions before the regression analysis to ensure the assumptions of the data analysis are met in this research. The results of the diagnostic tests are presented in Section 4.4 in chapter 4.

3.7.1.1 Collinearity Tests

To ascertain the non-collinearity of data set and to be sure that Ordinary Least Squares - OLS assumptions are addressed, Variance Inflation Factors (VIF) was used on the variance of an estimator, The VIF formula - $1 / (1-R^2)$. The guiding rule is that a VIF that exceeds 4 indicated the need for further investigation. At the same time, A VIF of 1 implied the absence of correlation among predictors. However, a serious multicollinearity sign was revealed when VIF exceeds 10 (Gujarati & Forter, 2010).

3.7.1.2 Normality Tests

The normality test for independent variables was conducted on the data since it is not possible to obtain accurate and reliable conclusions about reality when the assumption that the population from which the sample is extracted is distributed normally (Ghasemi & Zahediasl, 2012). The Kolmogorov-Smirnov test of normality was utilized to assess the null hypothesis that the data was normally distributed at a 95% confidence level.

3.7.2 Data Analysis

The collected study data was cleaned, edited, and coded into SPSS 25, followed by subsequent adoption of quantitative analysis techniques. The study relied on both descriptive and inferential statistics in the analysis. The descriptive statistics include simple mean and standard deviation. Since the data was collected was done with the use of SPSS 24 and presented with tables and graph.

Based on the above selecting diagnostics to establish the suitability of the study for inferential analysis the research employed multiple linear regression. This was deemed suitable in estimating the relationship between TOE and adoption of ecommerce. This study used the multiple regression analysis for quantifying the influence of various simultaneous influences upon a single dependent variable. A multiple linear regression model was used to test the significance of the influence of the independent variables on the dependent. The study further

applied the F-Statistic at a 5% level of significance was used to examine the significance of coefficients of variables in the model. The study adopted the following regression model:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

In which;

Y = adoption of e-commerce

B₀ - intercept coefficient

ε_i – error term (extraneous variables)

X₁ – technological factors

X₂ – organization factors

X₃ – environmental factors

β₁-β₃ = regression coefficients

3.8 Ethical Considerations

This study guaranteed that all relevant ethical guidelines are adhered to in the course of this research. This study secured ethical approval from the Strathmore University ethics committee before undertaking the research. The study made sure that all the participants of the study are informed of their consent to partake in the study, and anonymity was maintained. The study also ensured that permission is obtained from the National Commission for Science Technology and Innovation license is obtained before this study. The study also guaranteed that all the responses obtained are utilized only for academic purposes. The research ascertained that the response obtained from the research was treated with the utmost confidentiality, and the anonymity of the respondents was maintained.

CHAPTER FOUR

PRESENTATION OF RESEARCH FINDINGS

4.1 Introduction

This chapter presents the results of the statistical analysis of the collected research data. The chapter primarily presented the demographic information of the participants, the descriptive results, the correlation analysis, and regression analysis for the study variables.

4.2 Demographic Information

The study's aim was to collect responses from 217 logistic and transport firms in Nairobi County. The study utilized a drop and pick method as well as Google forms in the collection of research data. The study was able to successfully obtain 74% (n=162) responses, which were deemed statistically adequate for analysis based on the minimum standard set by Kothari (2012), who suggested that responses above 60% for surveys are adequate for analysis. The study sought to explore several demographic factors of the study participants. The results are presented in this section.

4.2.1 Age of Respondents

The study explored the age distribution among the study respondents, and the findings are presented in table 4.1. The findings on the table below presented the respondents distribution by age.

Table 4.1 Respondents Age

	Frequency	Per cent
Below 35 years	46	28.4
36 – 45 years	75	46.3
46 – 55 years	41	25.3
Total	162	100.0

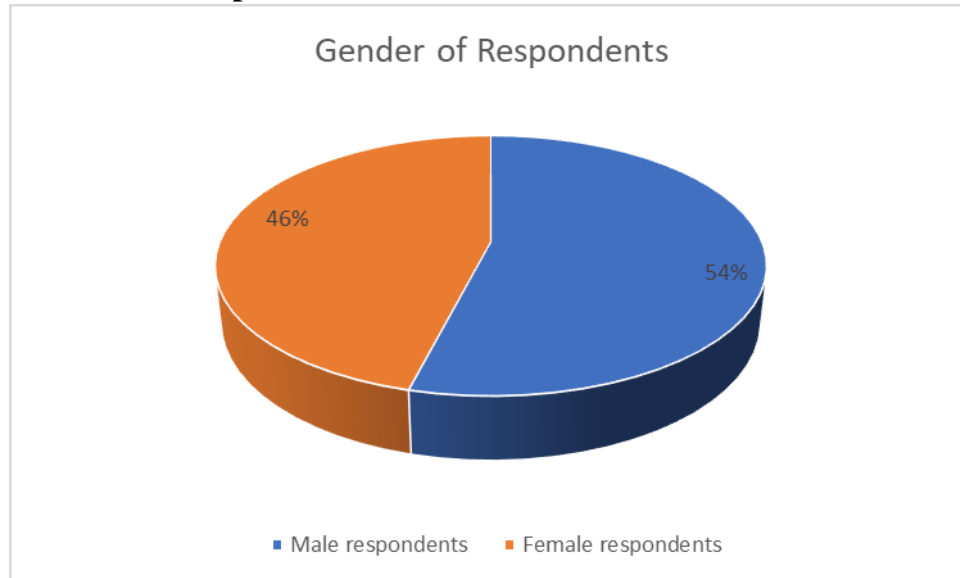
Source: Author (2020)

The results show that most of the study participants, 46% (n=75), were between the age of 36-45 years and 28% (n=46) of the respondents were below 35 years. These findings seem to suggest that managers within logistic firms are of a younger generation as depicted by the age distribution.

4.2.2 Gender of Respondents

The study analyzed the gender of the study participants, and the results indicate that 54% (n=88) were males. In comparison, 46% (n=74) were female employees within the logistics and transports industry. The findings suggest that the industry has made strides in recruiting women in a field that was previously almost an all-male industry.

Figure 4.1 Gender of Respondents



Source: Author (2020)

4.2.3 Education of Respondents

The study reviewed the education attainment of the study participants, and the results are presented in Table 4.2 below.

Table 4.2 Respondents in Education

	Frequency	Per cent
Diploma Level	84	51.9
Graduate	71	43.8
Post Graduate	7	4.3
Total	162	100.0

Source: Author (2020)

The study results indicate that 52% of the respondents had attained diploma level education, 44% had attained graduate-level education, while only 4% of the participants had post-graduate education. The findings suggest that most of the employees within the industry have attained some formal education, which is vital to strengthening their knowledge towards eCommerce adoption.

4.2.4 Length of Service in Organization

The study reviewed the length of time the study participants had worked in the industry, and the results are presented in Table 4.3 below.

Table 4.3 Respondents Length of Service

	Frequency	Percent
Less than one year	31	19.1
2-4 years	72	44.4
Over 5 years	59	36.4
Total	162	100.0

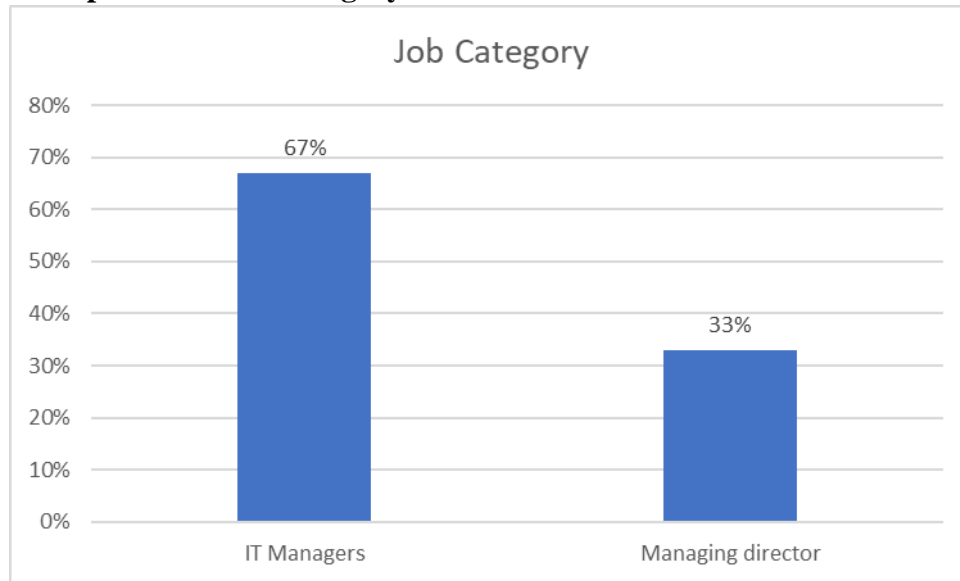
Source: Author (2020)

The findings show that 44% of the respondents had worked for at least 2-4 years within the industry, 37% had worked for more than 5 years, and 19% of the respondents had worked for less than a year in the logistics and transport industry. The results imply that the respondents to this research have been working within the industry for a long period; hence they hold vital information that can be relied upon in solving the study problem.

4.2.5 Job Position of Respondents

The findings indicated that 67% (n= 108) of the participants were information technology (IT) managers. In comparison, 33% (n=54) of the participants were the managing directors within the logistics and transport industry firms examined. The study results show that in most firms the owners double as the IT-managers. More so, the participants were in job categories that hold extensive knowledge on how the technology, organizational and environmental factors influence eCommerce adoption.

Figure 4.2 Respondents Job Category



Source: Author (2020)

4.3 Descriptive Analysis

The study employed a five-point Likert Scale questionnaire in the collection of responses from the study participants on the various statements covering the research variables. The findings were presented using means, standard deviation, and sums. Where you are using a 5-Likert scale interval of 1 to 5 (1= Strongly Disagree to 5=Strongly Agree). The means of responses are interpreted as follows; (5.00-4.21) indicates strongly agree, (4.20-3.41) indicates agree, (3.40-2.61) indicates neither agree nor disagree, (2.60-1.81) indicates disagree, and (1.80-1.00) indicates strongly disagree (Norman, 2010).

4.3.1 Descriptive Analysis for Technology Factors

The first variable of the study was the technology factors in the logistics and transport firms. The participants were presented with various statements on technology factors and the tabulation of the responses is presented below.

Table 4.4 Technology Factors Results

	N	Sum	Mean	Std.
	Statistic	Statistic	Statistic	Deviation
				Statistic
The firm has been fostering the automation of the significant services offered	162	616.00	3.8025	.80248
There has been an increase in the availability of technological infrastructure within the firm	162	612.00	3.7778	.93914

There is an increase in the accessibility of internet technologies within the logistics industry	162	574.00	3.5432	1.02211
There is an improvement in technological development within the logistics industry	162	629.00	3.8827	.82947
There is increased reliability on technological systems in the provision and delivery of services and products within the logistics industry	162	618.00	3.8148	.91382

Source: Author (2020)

The study findings indicate agreement among participants (mean= 3.8827) that there is an improvement in technological development within the logistics industry with a deviation of .82947, denoting moderate dispersion of the results from the mean. The results show agreement that there is an increased reliance on technological systems in the provision and delivery of services and products within the logistics industry, as indicated by a mean of 3.8148. The findings further showed agreement (mean = 3.5432, SD = 1.02211) that there is an increase in the accessibility of internet technologies within the logistics industry. The above results suggest that within most of the logistic firms, there is an improvement in technological development as well as increased reliability in technology in the provision of services and products.

4.3.2 Descriptive Analysis for Organization Factors

The second variable of the study was the organization factors in the logistics and transport firms. The respondents were given structured statements based on a 5-point likert scale and the analysis of the captured responses is presented below.

Table 4.5 Organization Factors Results

	N	Sum	Mean	Std.
	Statistic	Statistic	Statistic	Deviation Statistic
Their organization has put in place effective communication systems to improve information sharing	162	593.00	3.6605	.99791
The firm has developed an elaborate internal structure that supports improved coordination between business units	162	618.00	3.8148	1.13784

The organization has put in place clear shared values to promote attainment of firm goals	162	628.00	3.8765	1.07925
The organization size is adequate for the provision and adoption of emerging technologies	162	655.00	4.0432	.94145
The firm has put in place elaborate leadership competencies critical to effective attainment of organization goals	162	629.00	3.8827	1.11113
The organization is continuously recruiting talented staff that enhances the skills pool within the firm	162	620.00	3.8272	1.10662
The firm provides resources for staff to learn the adoption of e-commerce advancements	162	527.00	3.2531	1.12737

Source: Author (2020)

The results of the study indicate agreement that the organization size is adequate for the provision and adoption of emerging technologies (mean = 4.0432, sd = .94145). The findings further show agreement (mean = 3.8765) that the organization has put in place clear shared values to promote the attainment of firm goals. The findings also indicate agreement among participants that the firm has put in place elaborate leadership competencies critical to effective attainment of organization goals (mean = 3.8827, sd = 1.11113). The results indicated that respondents neither agreed nor disagreed that the firm provides resources for staff to learn the adoption of e-commerce advancements (mean = 3.2531, sd = 1.12737). The results show that most of the firms have adequate size to support the adoption of emerging technologies. The findings also imply that most of the firms do not provide resources to staff to enhance their learning on the adoption of emerging eCommerce.

4.3.3 Descriptive Analysis for Environment Factors

The third variable of the study was the environmental factors in the logistics and transport firms. The review of the various statements presented to the research participants on environmental factors are presented below.

Table 4.6 Environment Factors Results

	N Statistic	Sum Statistic	Mean Statistic	Std. Deviation Statistic
The business policies being implemented within the logistics industry are supportive of technological deployment in the firms	162	626.00	3.8642	1.05446
The government regulations in the country are supportive of the implementation of new technologies within the firms	162	685.00	4.2284	.82864
The firms within the logistics industry have been able to enhance collaboration with other partners in the maritime clusters	162	658.00	4.0617	1.02570
The market structure within the logistics industry is supportive of digitalization efforts within the firms	162	614.00	3.7901	1.16060
There is an increasing development of technologies within the logistic industry	162	636.00	3.9259	1.12319

Source: Author (2020)

The results indicate strong agreement among respondents (mean = 4.2284, sd = .82864) that the government regulations in the country are supportive of the implementation of new technologies within the firms. The findings indicate agreement (mean = 4.0617) that firms within the logistics industry have been able to enhance collaboration with other partners in the maritime clusters. The respondents agreed that there is an increasing development of technologies within the logistic industry (mean = 3.9259, sd = 1.12319), denoting high variations in responses. The results show agreement that the market structure within the logistics industry is supportive of digitalization efforts within the firms (mean = 3.7091). The results suggest that government regulations have helped support the implementation of new technologies in logistics firms. The respondents further show that the market structure in the logistics industry is key to digitalization within logistics firms.

4.3.4 Descriptive Analysis for E-Commerce Adoption

The dependent variable of the study was the e-commerce adoption in the logistics and transport firms. The participants were offered statements on various ecommerce adoptions aspects and the responses given were analyzed and presented below.

Table 4.7 E-Commerce Adoption Results

	N	Sum	Mean	Std.
	Statistic	Statistic	Statistic	Deviation Statistic
The e-commerce systems within the logistics industry are fully compatible with our organization systems	162	635.00	3.9198	.98421
Utilization of ecommerce innovations within the logistics industry is cost-effective	162	592.00	3.6543	1.28208
Ecommerce innovations have led to the integration of business units in the organization	162	587.00	3.6235	1.18487
There is an improvement in the market outreach by the firm as a result of e-commerce integration	162	617.00	3.8086	1.15039
The firm has put in place mechanisms to support digital transformation processes within the industry	162	621.00	3.8333	1.11037
There is improved efficiency within the firm as a result of e-commerce integration within the business	162	645.00	3.9815	.99983

Source: Author (2020)

The study results showed agreement (mean = 3.9815) that there is improved efficiency within the firm as a result of e-commerce integration within the business. The findings indicate agreement that e-commerce systems within the logistics industry are fully compatible with our organization systems (mean = 3.9198). The results indicate agreement that the firm has put in place mechanisms to support digital transformation processes within the industry (mean = 3.8333, sd = 1.11037). The findings also indicate agreement that e-commerce innovations have led to the integration of business units in the organization (mean 3.6235, sd = 1.18487), denoting high disparities in the responses obtained. The results implied that e-commerce adoption has led to the integration of new business units and has fostered efficiency within the business.

4.4 Diagnostic Tests

This study undertook linear regression assumptions before the regression analysis to ensure the assumptions of the data analysis are met in this research. The study applied collinearity tests and normality tests.

4.4.1 Collinearity Tests

To ascertain the non-collinearity of data set and to be certain that Ordinary Least Squares assumptions are met, the study applied the variance inflation factors.

Table 4.8 Multicollinearity Results

Model	Collinearity Statistics	
	Tolerance	VIF
1		
(Constant)		
Technology Factors	.525	1.903
Organization Factors	.477	2.097
Environment Factors	.597	1.676

a. Dependent Variable: eCommerce Adoption

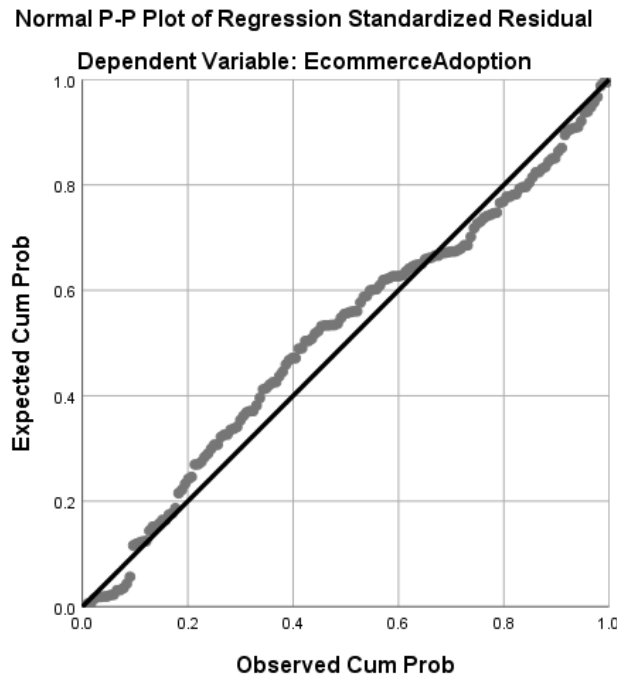
Source: Author (2020)

The study relied on the VIF values in interpreting the collinearity results. The guiding rule is that a VIF that exceeds 4 indicated the need for further investigation. At the same time, A VIF of 1 implied the absence of correlation among predictors. The study yielded the following results; technology factors (VIF = 1.903), organization factors (VIF = 2.097), and environment factors (VIF = 1.676). The above shows that none of the study variables violated collinearity assumptions; hence this shows an absence of correlation among predictors.

4.4.2 Normality Tests

The study further conducted normality tests using the residuals of the regression analysis to plot the normal p-p plot. The results shown below indicate that the study observations were fitted within the normal p-p plot, which implies that research data was from a normal distribution.

Figure 4.3 Normal P-P Plot



Source: Author (2020)

4.5 Correlation Analysis

The study applied correlation analysis to examine the type and significance of the effect of the independent variables on e-commerce adoption. The research utilized the Spearman rank correlation.

Table 4.9 Correlation Analysis

			Technolog y Factors	Organizatio n Factors	Environmen t Factors	E- commerce Adoption
Spear man's rho	Technology Factors	Correlation	1.000			
		Coefficient				
		Sig. (1-tailed)	.			
		N	162			
	Organization Factors	Correlation	.548**	1.000		
		Coefficient				
Sig. (1-tailed)		.000	.			
	N	162	162			

Environment Factors	Correlation Coefficient	.432**	.540**	1.000	
	Sig. (1-tailed)	.000	.000	.	
	N	162	162	162	
E-commerce Adoption	Correlation Coefficient	.471**	.594**	.483**	1.000
	Sig. (1-tailed)	.000	.000	.000	.
	N	162	162	162	162

** . Correlation is significant at the 0.01 level (1-tailed).

Source: Author (2020)

The first study objective sought to establish the effect of technology factors on the e-commerce adoption in logistics firms in Nairobi County. The findings show there is a moderate positive and significant effect of technology factors on the e-commerce adoption ($R_s = .471$, $Sig = .000 < .05$). Rahayu and Day (2015) similarly observed that technological capability, innovativeness and IT experience were essential to e-commerce adoption.

The second study objective sought to establish the effect of organization factors on the e-commerce adoption in logistics firms in Nairobi County. The results show there is a strong positive and significant effect of organization factors on the e-commerce adoption ($R_s = .594$, $Sig = .000 < .05$). Herzallah and Mukhtar (2015) noted that having an elaborate structure, culture, and aligning the internal firm processes are critical to e-commerce adoption.

The third study objective sought to establish the effect of environmental factors on the e-commerce adoption in logistics firms in Nairobi County. The findings show there is a moderate positive and significant effect of environmental factors on e-commerce adoption ($R_s = .483$, $Sig = .000 < .05$). Kurnia, Choudrie, Mahbubur, & Alzougool (2015) suggested that environmental pressures were critical to e-commerce technologies integration within retail firms.

4.6 Regression Analysis

The main objective of this study was to determine the effect of the technology organization environment framework on the adoption of e-commerce in logistics firms in Nairobi County. The study applied ordinary least squares regression to determine the magnitude of the relationship between the independent and dependent variables of the research.

Table 4.10 Regression Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.661 ^a	.437	.426	3.28667

a. Predictors: (Constant), Environment Factors, Technology Factors, Organization Factors

Source: Author (2020)

The study findings indicate a coefficient of determination of $R^2 = .437$ from the regression results. The results imply that 43.7% of the changes in the e-commerce adoption within logistics firms in Kenya are explained by the technology organization environment framework. In contrast, other factors not considered in the study account for 56.3% of the variations in eCommerce adoption.

The study further sought to determine if the regression model utilized in the study was statistically significant. The study utilized the ANOVA output to determine statistical significance.

Table 4.11 ANOVA Summary

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1325.060	3	441.687	40.889	.000 ^b
	Residual	1706.749	158	10.802		
	Total	3031.809	161			

a. Dependent Variable: eCommerce Adoption

b. Predictors: (Constant), Environment Factors, Technology Factors, Organization Factors

Source: Author (2020)

The results shown above indicate a calculated F-value of 40.889 (Sig = .000 < .05), which is higher than the critical value of 2.76, showing that the model is statistically significant in predicting the relationship between the technology organization and environment framework and e-commerce adoption.

Table 4.12 Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.335	1.692		3.153	.002
	Technology Factors	.249	.109	.188	2.278	.024
	Organization Factors	.456	.079	.499	5.771	.000
	Environment Factors	.039	.089	.034	.444	.657

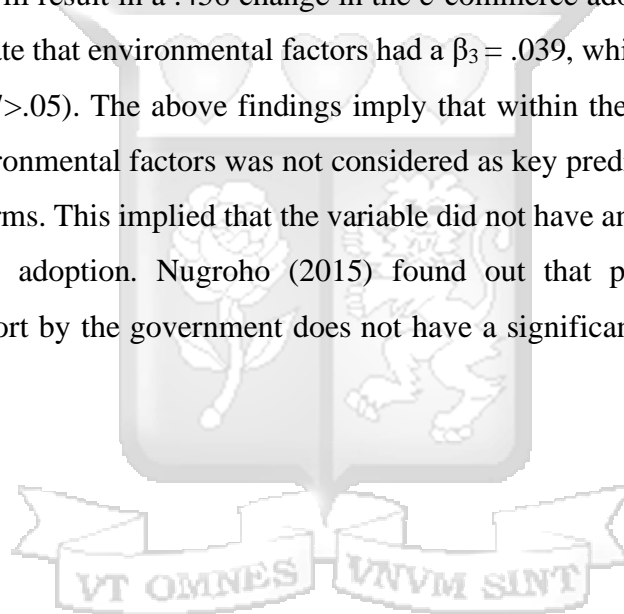
a. Dependent Variable: eCommerce Adoption

Source: Author (2020)

The resulting regression model is;

$$Y = 5.335 + .249X_1 + .456X_2 + .039X_3 + 1.692$$

The findings above imply that the constant of the regression equation $\beta_0 = 5.335$ was statistically significant ($\text{sig} = .002 < .05$). The results also indicate that technology factors had a $\beta_1 = .249$, which was statistically significant ($\text{sig} = .024 < .05$). This shows that a unit change in the level of technology factors will result in a .249 change in the e-commerce adoption in logistic firms. The findings show that organization factors had a $\beta_2 = .456$, which was statistically significant ($\text{sig} = .000 < .05$). This shows that a unit change in the level of organization factors will result in a .456 change in the e-commerce adoption in logistic firms. The results also indicate that environmental factors had a $\beta_3 = .039$, which was not statistically significant ($\text{sig} = .657 > .05$). The above findings imply that within the sampled firms among the TOE factors; environmental factors was not considered as key predictor of the ecommerce adoption within the firms. This implied that the variable did not have any statistical strength to influence ecommerce adoption. Nugroho (2015) found out that pressure from industry competitors and support by the government does not have a significant effect on technology adoption.



CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a summary of the findings, the conclusion, and recommendations presented in line with the objectives of the study. Areas of further research were also suggested while considering the results of the study. This research pursued three specific objectives upon which conclusions and recommendations were aligned.

5.2 Summary

Businesses currently leverage the ability to adapt and utilize ICT innovatively to promote their entrepreneurial performance. More so, the recent pandemic has shattered the global logistics and supply chain and revealed the various structural gaps and lack of capacities in the main smaller logistic and transport firms. The various available literature has shown that large firms that have been able to incorporate technological advancement in their systems and deploy e-commerce practices have witnessed a growth in their bottom-line. However, not all firms have been successful in the adoption of e-commerce. This study sought to establish the link between a technological organization and environment framework on the e-commerce adoption in logistic firms.

The research specifically reviewed the influence of technological factors, organization factors, and environmental factors on e-commerce adoption. The study utilized the diffusion of innovation theory, which was pertinent to the study since it emphasizes the processes the firms rely on integrating innovations within-firm operations. The research further applied the technology acceptance model, which fundamentally laid the foundation for understanding the factors that drive technology acceptance in firms. The study reviewed available extant literature to present the various gaps motivating the study. The research was grounded on a pragmatism research philosophy with a descriptive quantitative design being applied in the research.

The sample participants of the study were 217 logistic firms in Nairobi County, with a structured questionnaire being utilized in the data collection. The study employed a mix of descriptive and inferential techniques in analyzing and presenting the research data. The study was able to obtain a 74% response rate from the sampled firms. The responses obtained indicated that the majority of the participants were over 36 years of age, had attained graduate-level education, and at least 67% of the participants were IT managers within the firms. The results of the study indicated there was a positive correlation between the technology factors, organization factors, environment factors, and e-commerce adoption in logistics firms. The

regression analysis showed that 43.7% of the variations in e-commerce adoption could be attributed to the TOE framework. The results indicated that technology and organization factors significantly influenced ecommerce adoption while environmental factors did not have a significant influence on ecommerce adoption within the firms.

5.3 Discussion

5.3.1 Technology Factors

The first variable explored the technology factors within logistic firms. The results indicate agreement among participants that the firms have fostered the extent of automation of the major services offered. The findings also indicated that the firms had seen an increase in the availability of technological infrastructure within the firm. Vitorino, Filho, and Moori (2018) made similar observations that digitalization of firm processes, enhancing technological capability and innovativeness is critical to the adoption of IT systems. The review of the responses also showed that most firms had improved technological development within the logistics industry. Rahayu and Day (2015) also suggested that technological readiness and IT ability are essential to e-commerce adoption.

The findings further show there is increased reliability on technological systems in the provision and delivery of services and products within the logistics industry. This implies that logistics firms in the country have made advancements in the utilization of eCommerce adoption. In line with this Nigussie (2019) found that IT capability, IT readiness, and capabilities are critical to driving e-commerce adoption. The study results also showed there is an increase in the accessibility of internet technologies within the logistics industry. Njoroge and Kabare (2016) suggested that enhancing investment in ICT and increasing communication systems are key to better technology adoption. The findings show there is a positive and significant effect of technology factors on e-commerce adoption ($R_s = .471$, $Sig = .000 < .05$). Mutua, Oteyo, and Njeru (2013), in their study, also found a positive link between technological know-how, availability of technology infrastructure, and e-commerce integration.

5.3.2 Organization Factors

Concerning the organization factors, the participants agreed that the organization has put in place effective communication systems to improve information sharing. The results also indicated that most firms had developed an elaborate internal structure that supports improved coordination between business units. The findings of the study also showed that the organization has put in place clear shared values to promote the attainment of firm goals.

Herzallah and Mukhtar (2015), in their study, also established that appropriate organization cultures, unique culture, internal processes, and technological capacity are vital to e-commerce implementation.

The study results also indicate that the size of the firm is adequate for the provision and adoption of emerging technologies. The respondents agreed that the firm has put in place elaborate leadership competencies critical to the effective attainment of organization goals. Awiagah, Kang, and Lim (2016), in a similar vein, note that the internal environment and managerial support are key drivers of e-commerce adoption. The study results further showed that the firms are constantly recruiting talented staff that enhances the skills pool within the firm as well as providing resources for staff to learn the adoption of e-commerce advancements. The results show there is a positive and significant effect of organization factors on the e-commerce adoption ($R_s = .594$, $Sig = .000 < .05$). The findings are also consistent with Herzallah and Mukhtar (2015). They found out that organization and technological factors are significant predictors of e-commerce adoption. Nega (2019) also indicated that IT capability had a statistically significant influence on the adoption of e-commerce. Contrary to these results, Mekasha (2015) found out that organization factors were not significant predictors of technology adoption.

5.3.3 Environment Factors

Concerning the environmental factors, the findings of the study indicated that business policies being implemented within the logistics industry are supportive of technological deployment in the firms. Nugroho (2015) also made similar observations that industry pressure, the readiness of the industry, and competitors' adoption were key drivers of information technologies adoption. Study results showed that government regulations in the country are supportive of the implementation of new technologies within the firms. The participants were also in agreement that firms within the logistics industry have been able to enhance collaboration with other partners in the maritime clusters. The study findings also show that the market structure within the logistics industry is supportive of digitalization efforts within the firms. Tefera-Tekle (2017) also suggested that interoperability and formulating better regulatory policies are key to driving e-commerce adoption. The respondents also indicated that there is an increase in the development of technologies within the logistics industry.

Koskei (2016) notes that aligning a firm's internal and external strategies are key to the integration of IT platforms in organizations. Ajowi and Reuben (2019) also suggested that regulatory factors and strategic linkages were critical to the adoption of cloud computing

technologies. In contrast to earlier literature, the findings of this study indicated that environmental factors on their own do not have a significant effect on eCommerce adoption. This is aligned with Nugroho (2015), who found out that government regulation and pressure from other market players did not have a significant influence on technology adoption.

5.4 Conclusions

The study concluded that the technology organization and environment framework positively and significantly influenced e-commerce adoption. Based on the first objective the study concluded that the technology factors have a significant and positive influence on e-commerce adoption. The study revealed that enhancing automation of services, availing adequate technological infrastructure, enhancing technological development, and relying on technologies in service provision enhanced the level of e-commerce adoption. With regard to the second objective the organization factors, the study concluded there was a positive and significant influence on e-commerce adoption. The findings showed that having elaborate communication, leadership competencies, recruiting the right staff, effective internal structures, and shared values are critical to e-commerce adoption. The third objective examined environmental factors and the research concluded that environmental factors have an insignificant impact on e-commerce adoption in logistic firms.

5.5 Contribution to this Study

5.5.1 Policy Contribution

The logistics industry is central to spurring economic growth, and the findings of this study present key results that can be harnessed to improve policymaking. To the line ministry, the study findings can be utilized in alleviating the regulatory bottlenecks that are limiting the eCommerce firm's adoption of new technologies. Further, the study results can support relevant government agencies in creating a conducive market environment that can spur the logistics firm's growth, which can be integral to effective eCommerce adoption. The findings can also be of importance to various logistic bodies in developing industry guidelines for eCommerce adoption.

5.5.2 Practice Contribution

The findings of this research are expected to yield critical knowledge that can be applied by the management team of logistic firms in guiding their eCommerce adoption strategies. The results have suggested that organizational factors and technological factors are significant predictors of eCommerce adoption. Thus, the results can contribute to strategic decision making within the management team to improve technological development and foster the

readiness of the firm to integrate new technologies. The study results have also shown that eCommerce adoption has improved the efficiency and effectiveness of the logistic firms; thus, the results can be relied upon by the management firms to improve the performance of their organizations through the usage of eCommerce.

5.5.3 Theoretical Contribution

The study extends the implication of the diffusion of innovation theory within the context of eCommerce firms. The diffusion of innovation theory has suggested that the integration of new innovations in business results in improved production and cost-effectiveness. The findings of the study reaffirm this by showing that eCommerce adoption has resulted in cost-effectiveness, improvement market outreach, efficiency, and cost-effectiveness. The Technology Acceptance Model has been used to explain various factors driving the acceptance of new technologies. In this study, it was applied in understanding how the TOE framework influences the adoption of eCommerce. The study was able to establish that technology, organizational and environmental factors do determine the adoption of eCommerce despite the analytical differences; hence the model can be further be used in a similar context.

5.6 Recommendations

The study recommends that policymakers such as the Ministry of Transport and Logistic associations will need to come up together to create synergistic relations that can be critical to supporting the formulation of guidelines and implementation plans that can be utilized by logistics firms to adopt e-commerce. The study further recommends that firms in the logistic industry should seek an audience with government agencies in a bid to seek regulatory support through incentives and better legislation to drive e-commerce adoption in the firms.

Concerning the technology factors, the research recommends that logistic firms should review the best practices adopted by international logistics firms in selecting the best IT infrastructure that can be compatible with the local operations. Further, logistics firms should increase investment in IT systems such as tracking systems, inventory management systems, and fleet management systems, which can guide digitalization of the firm services. The study also recommends that logistic firms should foster the IT capability and readiness of the firm through constantly reviewing the technological capacity of the firm and the usability of the various technologies in the industry.

Concerning the organization factors, the research recommends that the firm should evaluate the internal communication systems to ensure that information is shared across the firm easily as this is key to the acceptance of new technologies. The study also recommends that the

organization should enhance its resource allocation to the professional development of their staff as this will enhance their competencies and ability to run the firm towards better e-commerce adoption. The study further recommends that the organization should continuously review the internal structures and the culture to ensure alignment with the e-commerce systems.

Concerning the environmental factors, the study found out that it does not have a significant contribution to eCommerce adoption. Thus, this research recommends that the firms should review the business environment to ensure that e-commerce systems being integrated into the firm are in line with the industry needs. The study further recommends that the firm should review the technologies being applied by other competitors to ensure that e-commerce systems being adopted internally are interoperable with other industry players.

5.7 Limitations of the Study

The research was limited geographically to the examination of logistic firms within Nairobi County; hence the results may not be generalized across the country. The research was further hampered by the ongoing lockdown restrictions due to Covid-19, which limited the efficiency in the collection of research data. The study was further limited to three independent variables focusing on the TOE proxies. The implications of the study are limited to the extent of those variables.

5.8 Areas for Further Research

The findings of the research indicated that environmental factors did not significantly influence e-commerce adoption. The study suggests that further research should be conducted to explore the influence of government regulation and business environment on the e-commerce adoption in logistics firms. The research only considered the technology, organizational, and environmental factors; hence there is a need for further research work to be conducted, taking into consideration more factors and how they influence the eCommerce adoption.

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APPENDICES

Appendix I: Introduction Letter

To the Managing Director

..... Logistics Company

Nairobi Kenya

Dear Sir/Madam

REF: FACILITATION FOR RESEARCH DATA COLLECTION

Hello, I am Paul Kabia, a Master's in Business Administration student at Strathmore University. As a part of the requirements for the award of the Degree, I am expected to undertake a research study on my area of specialization. I am currently seeking to establish the effect of technology, organization and environment framework on the Ecommerce Adoption within Logistics firms in Nairobi County.

To this end, I request that you allow me to interview the technology manager within your firm as part of the participants in the research. The collected research data was only utilized for academic purposes, and the responses remained confidential. I anticipate positive feedback on my request.

Warm Regards,

Paul Kabia

Appendix II: Research Questionnaire

1) What is your Age Bracket?

Below 35 years

36 – 45 years

45– 56 years

56 and above

2) What is your Gender?

Male

Female

3) What is your Education Level?

O- Level

Diploma

Graduate

Postgraduate

4) How long have you worked within the organization?

Less than 2 years

2-4 years

Over 5 years

5) Which office do you operate within?

Information Technology Manager

Managing Director

PART B: TECHNOLOGY ORGANIZATION ENVIRONMENT FRAMEWORK IN LOGISTIC FIRMS IN NAIROBI COUNTY

Please tick the level of agreement of the following statements, as shown in the table.

Please indicate in the table with a tick (✓) or across (×) with a scale of

5= strongly agree 4= Agree 3= Neither agree nor disagree 2= Disagree 1= Strongly Disagree

No	Technology Factors	5	4	3	2	1
----	--------------------	---	---	---	---	---

6.	The firm has been fostering the automation of the major services offered					
7.	There has been an increase in the availability of technological infrastructure within the firm					
8.	There is an increase in the accessibility of internet technologies within the logistics industry					
9.	There is an improvement in technological development within the logistics industry					
10.	There is increased reliability on technological systems in the provision and delivery of services and products within the logistics industry					

Please indicate in the table with a tick (√) or across (×) with a scale of

5= strongly agree 4= Agree 3= Neither agree nor disagree 2= Disagree 1= Strongly Disagree

No	Organization Factors	5	4	3	2	1
11.	Their organization has put in place effective communication systems to improve information sharing					
12.	The firm has developed an elaborate internal structure that supports improved coordination between business units					
13.	The organization has put in place clear shared values to promote attainment of firm goals					
14.	The organization size is adequate for the provision and adoption of emerging technologies					
15.	The firm has put in place elaborate leadership competencies critical to effective attainment of organization goals					
16.	The organization is constantly recruiting talented staff that enhances the skills pool within the firm					

17.	The firm provides resources for staff to learn the adoption of ecommerce advancements					
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Please indicate in the table with a tick (√) or across (×) with a scale of

5= strongly agree 4= Agree 3= Neither agree nor disagree 2= Disagree 1= Strongly Disagree

No	Environmental Factors	5	4	3	2	1
18.	The business policies being implemented within the logistics industry are supportive of technological deployment in the firms					
19.	The government regulations in the country are supportive of the implementation of new technologies within the firms					
20.	The firms within the logistics industry have been able to enhance collaboration with other partners in the maritime clusters					
21.	The market structure within the logistics industry is supportive of digitalization efforts within the firms					
22.	There is an increasing development of technologies within the logistic industry					

PART C: THE ADOPTION OF E-COMMERCE IN LOGISTIC FIRMS IN NAIROBICOUNTY

Please indicate in the table with a tick (√) or across (×) with a scale of

5= strongly agree 4= Agree 3= Neither agree nor disagree 2= Disagree 1= Strongly Disagree






No	E-Commerce Adoption	5	4	3	2	1
23.	The e-commerce systems within the logistics industry are fully compatible with our organization systems					
24.	Utilization of ecommerce innovations within the logistics industry is cost-effective					

25.	Ecommerce innovations have to lead to the integration of business units in the organization					
26.	There is an improvement in the market outreach by the firm as a result of ecommerce integration					
27.	The firm has put in place mechanisms to support digital transformation processes within the industry					
28.	There is improved efficiency within the firm as a result of ecommerce integration within the business					

Thank you for your Time



Appendix III: NACOSTI Permit

 REPUBLIC OF KENYA	 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
Ref No: 549536	Date of Issue: 28/March/2020
RESEARCH LICENSE	
	
This is to Certify that Mr.. Paul Githui Kabia of Strathmore University, has been licensed to conduct research in Nairobi on the topic: EFFECT OF TECHNOLOGY ORGANIZATION ENVIRONMENT FRAMEWORK ON THE ADOPTION OF E-COMMERCE IN LOGISTIC FIRMS IN NAIROBI CITY COUNTY for the period ending : 28/March/2021.	
License No: NACOSTI/P/20/4509	
549536 Applicant Identification Number	 Director General NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
Verification QR Code	
	
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THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013

The Grant of Research Licenses is Guided by the Science, Technology and Innovation (Research Licensing) Regulations, 2014

CONDITIONS

1. The License is valid for the proposed research, location and specified period
2. The License any rights thereunder are non-transferable
3. The Licensee shall inform the relevant County Director of Education, County Commissioner and County Governor before commencement of the research
4. Excavation, filming and collection of specimens are subject to further necessary clearance from relevant Government Agencies
5. The License does not give authority to transfer research materials
6. NACOSTI may monitor and evaluate the licensed research project
7. The Licensee shall submit one hard copy and upload a soft copy of their final report (thesis) within one of completion of the research
8. NACOSTI reserves the right to modify the conditions of the License including cancellation without prior notice

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P. O. Box 30623, 00100 Nairobi, KENYA
Land line: 020 4007000, 020 2241349, 020 3310571, 020 8001077
Mobile: 0713 788 787 / 0735 404 245
E-mail: dg@nacosti.go.ke / registry@nacosti.go.ke
Website: www.nacosti.go.ke

Appendix IV: Ethics Review Permit



Strathmore
UNIVERSITY

16th April 2020

Mr Kabia, Paul
paul.kabia@strathmore.edu

Dear Mr Kabia,

RE: Effects of Technology organization environment framework on the adoption of e-commerce in logistic firms in Nairobi City County

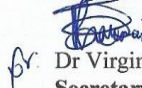
This is to inform you that SU-IERC has reviewed and **approved** your above research proposal. Your application approval number is **SU-IERC0774/20**. The approval period is **16th April 2020 to 15th April 2021**.

This approval is subject to compliance with the following requirements:

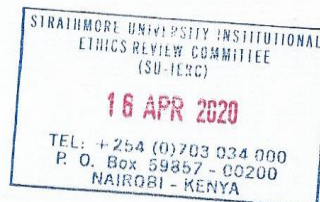
- i. Only approved documents including (informed consents, study instruments, MTA) will be used
- ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-IERC.
- iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-IERC within 72 hours of notification
- iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-IERC within 72 hours
- v. Clearance for export of biological specimens must be obtained from relevant institutions.
- vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
- vii. Submission of an executive summary report within 90 days upon completion of the study to SU-IERC.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) <https://oris.nacosti.go.ke> and also obtain other clearances needed.

Yours sincerely,


Dr Virginia Gichuru,
Secretary; SU-IERC

Cc: Prof Fred Were,
Chairperson; SU-IERC



Ole Sangale Rd, Madaraka Estate. PO Box 59857-00200, Nairobi, Kenya. Tel +254 (0)703 034000
Email info@strathmore.edu www.strathmore.edu

Appendix V: List of Logistics Firms in Kenya

1. Acceler Global Logistics Limited
2. Alibhai Ramji (Msa) Limited
3. Beyond Chance Freight Services Ltd
4. Bahari Forwarders Limited
5. All Cargo Global Logistics Ltd
6. Big Ways Ltd
7. Beach Lines Ltd
8. All Freight Logistics Limited
9. Bildad Enterprises Limited
10. Bollore Africa Logistics
11. All Marine Services Limited
12. Bima Clearing And Forwarding Limited
13. Conventional Cargo Conveyors Limited
14. All Scope Logistics Limited
15. Birdwell Ventures Limited
16. Cornerstone Limited
17. Alliance Logistics Kenya Limited
18. Black Stallion Shipping Services Ltd
19. Corrugated Sheet Limited
20. Allports Kenya Limited
21. Blackstone Logistics Limited
22. Damco Logistics Kenya Ltd
23. Almeo Logistics Limited
24. Blink Logistics Limited
25. Global Freight Logistics Ltd
26. Al-Mustaqim Trading Co (K) Ltd
27. Blitz Logistics Ltd
28. Intraspeed Arcpro Kenya Ltd
29. Alpha Impex
30. Logistics International Limited
31. Blue Lime Limited
32. Kensco Business Solutions Ltd
33. Alpha Worldwide Freight Limited
34. Blue Ocean (E.A) Co. Ltd
35. Mitchell Cotts Freight Kenya Limited
36. Alpine Trading Limited
37. Blue Pearl Logistics Limited
38. Muranga Forwarders Ltd
39. Al-Shog Systems Limited
40. Blue Seal Freighters
41. Rapid Kate Services Ltd
42. Alujo Enterprises Co. Ltd
43. Blue Star International Limited
44. Regional Entrepreneurs (K) Ltd
45. Al-Yum Hauliers



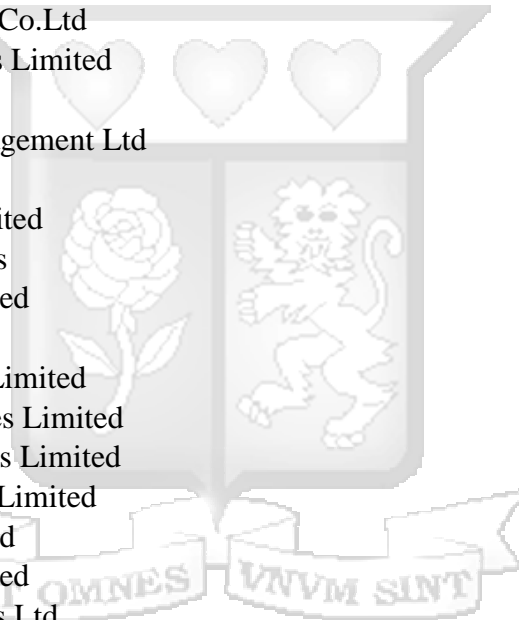
46. Blue Tide Freight Logistics Limited
47. Speedex Logistics Limited
48. Amarantha Agency Ltd
49. Bluehill Investments Ltd
50. Starway International Freight & Forward
51. Amazon Freight Ltd
52. Blueplus Flighters Ltd
53. Vision Enterprises Limited
54. Amberto Agencies Limited
55. Bluerange Logistics Limited
56. Abba Motors Limited
57. Amey Trading Com.Limited
58. Bluewave Logistics Services Limited
59. Abbas Traders Ltd
60. Anisa Agencies Kenya Limited
61. Bogani Freight Services Ltd
62. Aberpaul Limited
63. Ankey Freight Forwarders Ltd
64. Bolt Speed Cargo Forwarders Limited
65. Absolute Freight Services And Log.Ltd
66. Apex Limited
67. Bonfide Clearing And Forwarding Company Limited
68. Access Africa Logistics Limited
69. Apex Steel Limited
70. Boon Trade Agencies Ltd
71. Ace Freight Ltd
72. Apple Logistics Limited
73. Borabu Freight & Transport Services
74. Acts Business Systems
75. Aramex Kenya Limited
76. Branded Fine Foods Limited
77. Adair Freight Services Ltd
78. Armed Forces Ordnance Depot
79. Bransan Clearing & Forwarding Lt
80. Adelcus Agencies (K) Limited
81. Aeromarine Cargo Services Limited
82. Atis Logsol Ltd
83. Bulk Trading (K) Ltd
84. Aeropath Kenya Limited
85. Atlantic Logistics International Limited
86. Burhani Express Logistics Limited
87. Affaires Afrique Limited
88. Baabz Freight Forwarders Ltd
89. Buyers Logistics Limited
90. Africa Direct Ltd
91. Bahari Transport Company Limited



92. Callfast Services Limited
93. Africa Link Forwarders Kenya Limited
94. Bakol Freighters
95. Calwin Logistics Ltd
96. Cargo Nest Kenya Ltd
97. Airfreight & Logistics Worldwide Limited
98. Bemms Ltd
99. Cargocare International Limited
100. Airmarine Conveyors (K) Ltd
101. Benairs Logistics Limited
102. Cargodeck E.A Ltd
103. Akamai Freight Forwarders Ltd
104. Beneli Freighters Ltd
105. Cargolog (E.A) Ltd
106. Al -Emir Ltd
107. Benjoe Logistics Ltd
108. Cargomania Ltd
109. Alcordia Logistics Limited
110. sborder Cargo Limited
111. Emotel Kenya Limited
112. Gemini Global Express Ltd
113. Crossborder Networks Ltd
114. Enerlog Limited
115. General Cargo Services Ltd
116. Crown Industries Ltd
117. Equirak Logistics Ltd
118. General Freighters Limited
119. Crucial Cargo Movers
120. Escom Oil Limited
121. General Motors East Africa Limited
122. Culzenberg Forwarders Limited
123. Eugfavour Logistics Solutions Limited
124. Geomwa Express Cargo Ltd
125. Dalsan Freighters Limited
126. Euro Marine Logistics
127. Georine Agencies Limited
128. Damasa Freight Forwarders Limited
129. Everlast Enterprises Limited
130. Gibron Limited
131. Danjam Investments Company Limited
132. Everstan Freight And Logistics Co.Ltd
133. Gifco (K) Limited
134. Danros Kenya Ltd
135. Expedite Logistics Limited
136. Gimbeo Freight Limited
137. Dansaf Logistics Limited



138. Expeditors Cargo Logistics Limited
139. Giraffe Forwarders Ltd
140. Dap Logistics Limited
141. Expolanka Freight Limited
142. Gladin Logistics
143. Daveline Network Company Ltd
144. Export Consolidation Services
145. Gliner Logistics Limited
146. Davis & Shirtlift Ltd
147. Export Trading Co Ltd
148. Global Business Commanders Ltd
149. Davmat Company Limited
150. Express Kenya Limited
151. Global Cargo Movers Ltd
152. Deccan Freight Logistics Limited
153. Exxem Express Cargo Co. Ltd
154. Global Reach Logistics Limited
155. Deepmark Cargo Ltd
156. Eyeblick Freight Management Ltd
157. Gmk East Africa Ltd
158. Dekam Freighters Limited
159. Simba Shipping Agents
160. Gn Cargo Kenya Limited
161. Del Monte (K) Ltd
162. Faida Cargo Services Limited
163. Golden Freight Services Limited
164. Del Ray Cargo Services Limited
165. Fair Logistics Agency Limited
166. Goldfields Logistics Ltd
167. Delfast Logistics Limited
168. Fairways Consolidators Ltd
169. Good Freight International Company Ltd
170. Delta Cargo Connections 2011 Ltd
171. Famo Forwarders Limited
172. Greatspan Maritime Services Ltd
173. Delta Express
174. Fantashi Freighters & Logistics Ltd
175. Green Leaf Trading Company
176. Delta Handling Services Ltd
177. Farihama Trading Company Limited
178. Groundline Investment Services Ltd
179. Denali Logistics Limited
180. Fasmu Freight Forwarders Ltd
181. Gulf Cross Limited
182. Destiny Conveyors Ltd
183. Feliben International Limited



184. Haika Logistics Services Ltd
185. Destiny Freight Services Ltd
186. Feliclearcon Company Limited
187. Hambufreight Services Ltd
188. Dhl Global Forwarding (K) Ltd.
189. Ferida Enterprises Limited
190. Hamdi International Ltd
191. Dhl Worlwide Express
192. Fiber Freight Forwarders
193. Hangool Investment Group Limited
194. Diamond Express Logistics Ltd
195. Filiken Transit Forwarders Limited
196. Hansol Logistics Kenya Ltd
197. Digital Cargo Forwarders Ltd
198. Filmline Ltd
199. Harls Cargo Logistics Ltd
200. Dikens Logistics Ltd
201. Firsthand Cargo Handlers Ltd
202. Hasmad Cargo Ltd
203. Direct Wheelers Express Ltd
204. Flowerport Logistics Limited
205. Hass Petroleum Kenya Ltd
206. Flowerwings Express (K) Limited
207. Hebatullah Brothers Ltd
208. Hebatullah Brothers Ltd
209. Heme Freighters
210. Juwells Trading Co.Ltd
211. Logistics Link Ltd
212. Heritage Cargo Movers Limited
213. K B Freighters Limited
214. Logistics Services Limited
215. Heros Company Limited
216. Kaaba Investments Ltd
217. Logistics Solutions Co.Ltd
218. Highlands Forwarders Ltd
219. Kadmus Freight Logistics Limited
220. Logwin Air & Ocean (K) Ltd
221. Hima Freight Forwarders Limited
222. Kaiser Agencies Ltd
223. Longrange Trading & Logistics Limited
224. Hi-Tech Impex Limited
225. Kalemu Freighters Ltd
226. Longroad Logistics (K) Ltd
227. Homeland Freight Ltd
228. Kamanga Freight Services Limited
229. Low Sea International Agencies Limited



230. Intercities Freight & Shipping Ltd
231. Kenya Bonded Warehouse Company
232. Mar Frontier (K) Ltd
233. Interface Agencies Ltd
234. Kenya General Industries Ltd
235. Maraca Enterprises Ltd
236. Interken Enterprises
237. Kenya Vehicle Manufacturers Ltd
238. Marakib Freighters Limited
239. International Commercial Co. Ltd
240. Kenya Wine Agencies Limited
241. Mardav Logistics Limited
242. International Committee Of The Red Cross
243. Kevian Kenya Limited
244. Margie Agencies (K) Ltd
245. International Foreign Trade Co. Ltd
246. Keynaut Logistics Limited
247. Marichor Marketing Services
248. Interscope Airmaritime Logistics Limited
249. Kiamba Clearing And Forwarding Ltd
250. Maritime Freight Co. Ltd
251. Interspeed Logistics Ltd
252. Kimm Freighters (K) Ltd
253. Mark Riech (A) Ltd
254. Intime Freight & Cargo Services Company Ltd
255. Kimnet Agencies
256. Marks Enterprises Limited
257. Jaav Global Cargo Limited
258. Kimu Freight Agencies Ltd
259. Marydavid Investments Limited
260. Jagoma Logistics Limited
261. Kind Logistics Ltd
262. Marymac Freight Company
263. Jambo Logistics E.A Limited
264. Kings Cargo Agencies Ltd
265. Mascot Holdings Limited
266. Jambo Traders Ltd
267. Kipkebe Limited
268. Masterpiece Courier Services Ltd
269. James Finlay Mombasa Ltd
270. Kiseli & Kalekye Logistics Limited
271. Matsingberg Clearing & Forwarding Limited
272. Jamreks Enterprises
273. Kodavi Investments Ltd
274. Maya Duty Free Ltd
275. Jamusa Enterprises Limited



276. Kuehne +Nagel Limited
277. Mbaraki Port Warehouses (K) Limited
278. Jaspa Freight Ltd
279. Laboratory & Allied Ltd
280. Menengai Oil Refineries Ltd
281. Aspa Logistics Limited
282. Land Bridge Freighters Ltd
283. Menhir Limited
284. Jay And Jay Logistics Ltd
285. Landmark Port Conveyors Ltd
286. Mentap Resource Freight Ltd
287. Jedima Trade Agencies Ltd
288. Lape Hill Logistics Ltd
289. Mercico Limited
290. Jemi Freight Limited
291. Las Airfreight Ltd
292. Meshack Global Enterprises Ltd
293. Jihan Freighters Limited
294. Laxat Traders Limited
295. Meteor Freight Forwarders Company Limited
296. Jiji East Africa Ltd
297. Leadtime Cargo Logistics Limited
298. Mfanco Agencies Ltd
299. Jipe Holdings Limited
300. Leena Apparels Ltd
301. Mid Africa Services Limited
302. Jires Limited
303. Lemco Freight Forwarders Ltd
304. Mid Ocean Limited
305. Jmk Enterprises Ltd
306. Libaan Ltd
307. Mid-Wave Freighters Ltd
308. Oki View General Kenya Limited
309. Liftcargo Limited
310. Mig Forwarders Limited
311. Jonerics Cargo Forwarders Limited
312. Lily Logistics Limited
313. Milano Logistics Limited
314. Jopalm Clearing & Forwarding Limited
315. Limutti Holdings Limited
316. Milestone Consultans Ltd
317. Jopuka Logistics Limited
318. Linkage Conveyors Ltd
319. Milleage Enterprises Limited
320. Jora Logistics Limited
321. Linkfreight (Ea) Ltd



322. Millennium Solutions Limited
323. Jordan Freighters Ltd
324. Linkon Investments Limited
325. Mnet Stars Limited
326. Jowak Agencies Ltd
327. Lino Stationers (K) Ltd
328. Mohabab Enterprises Limited
329. Jowaka Super Links Ltd
330. Lloyds Logistics Limited
331. Molo Freighters Ltd
332. Jowam Cargo Company Limited
333. Logenix International
334. Mombasa Coffee Ltd
335. Jubilee Clearing And Forwarding E.A Limited
336. Logistic Freight Limited
337. Mombasa Commercial & Industrial Enterprises Ltd
338. Logistics 365 Ltd
339. Mombasa Logistics Limited
340. Mombasa Times Logistics Limited
341. Pan Africa Logistics Ltd
342. Ripe Freight Services Limited
343. Momo Clearing And Forwarding Co.Ltd
344. Pan African Syndicate Ltd
345. Rising Freight Limited
346. Monsoon Movers Enterprises Ltd
347. Panal Freighters
348. Robiam Cargo Freighters Ltd
349. Morgan Air Cargo
350. Panalpina Airflo Ltd
351. Rolling Cargo Limited
352. Morning Glory Freight Services Limited
353. Pantel Chemicals Ltd
354. Romark Freighters Ltd
355. Move And Pick Logistics Ltd
356. Pedwin Limited
357. Romax Forwarders Limited
358. Mtapanga Agencies Limited
359. Peerless Tea Services Ltd
360. Rorene Limited
361. Mucheba Services
362. Pejon Freight Movers Ltd
363. Rosmik Trading Company Limited
364. Multcargo Freighters Ltd
365. Pentagon Logistics Limited
366. Salimond Freight Services Ltd
367. Neline Shipping And Logistics



368. Priority Air Express Ltd
369. Salmir Clearing & Forwarding Company Limited
370. Neosealand Regional Freighters Ltd
371. Priority Logistics Limited
372. Samphy Logistics Services
373. Neoserve Logistics Limited
374. Prometech Limited
375. Sandek Agencies Limited
376. Neptune Forwarders Ltd
377. Provisional Clearing & Forwarding Ltd
378. Sasi International Freight Logistics Limited
379. New Wide Garments
380. Pura Logistics Limited
381. Sawa International Ltd
382. Nibal Freighters Ltd.
383. Queens Cargo International Ltd
384. Schenker Limited
385. Nnito Trading Limited
386. Quick Cargo Services
387. Seabase Solutions Ltd
388. Noadan Trading Company Limited
389. Quickmovers (K) Ltd
390. Seabridge Forwarders Ltd
391. Nodor Kenya Epz Limited
392. Quissan Enterprises Limited
393. Seacon (K) Ltd
394. Nyagaka Forwarders
395. Radiant Logistics Limited
396. Seacrest Logistics Solutions Ltd
397. Ocean Pacific International Lines Ltd
398. Radisson Limited
399. Sealine Forwarders Limited
400. Ocean Star General Agents Ltd
401. Rahma Logistics Limited
402. Sealine Logistics Ltd
403. Oceanic Cargo Agency Ltd
404. Rai Plywoods (K) Ltd
405. Seashore Shipping Services Co. Ltd
406. Oceanline Freight Forwarders Ltd
407. Rank Network Logistics Limited
408. Sea-Sky Express Limited
409. Oceanline Freighters E.A. Limited
410. Rapat Freight (K) Ltd
411. Seatel Investments Ltd
412. Oceanrock Logistics Limited
413. Seaway Maritime Limited



414. Rift Cargo Handling Limited
415. Silver Anchor Freighters Limited
416. Pamol Connections Services
417. Rige Limited
418. Silver Silicon Limited
419. Superquick Freighters Ltd.
420. Union Clearing & Forwarding Ltd
421. Silverhawk Cargo Ltd
422. Supersonic Clearing & Forwarding Services Ltd
423. Union Express Ltd
424. Simba Apparel (Epz) Ltd
425. Supersonic Freighters (K) Ltd
426. Union Logistics Limited
427. Simmonds Cargo Services Ltd
428. Suzan Duty Free
429. United (E.A) Warehouses Ltd
430. Simptons East Africa Holdings Ltd
431. Sylka Kenya Ltd
432. United Aryan Epz Ltd
433. Sisco Superior Cargo Handling Services Limited
434. Syller Impress Company Limited
435. United Clearing Company Ltd
436. Site Forwarders Limited
437. Tabaki Freight Services Limited
438. United Freight Logistics Ltd
439. Sivorine Kenya Limited
440. Tallient Logistics Ltd
441. Universal Freighters Limited
442. Sky & Sea Cargo Track Limited
443. Tamanya Freight And Logistics Services Limited
444. Upesi Freight Logistics Limited
445. Skylark Conveyors (K) Ltd
446. Tandem Freight Services Ltd
447. Utex Freight Services Limited
448. Skylift Cargo Ltd
449. Tandem Solutions Limited
450. Utility Freight Logistics Ltd
451. Skylight Logistics Ltd
452. Techno Relief Services Limited
453. Utmost Freight Masters Limited
454. Skyline Express Services Ltd
455. Tedice Express Agencies Ltd
456. Vantage Point Clearing & Forwarding Co. Ltd
457. Skyline Global Services Ltd
458. Tellam Freight Forwarders Ltd
459. Vast Network Logistics Limited



- 460. Skylux Logistics Ltd
- 461. Tenya Logistics Ltd
- 462. Vasterguard Limited
- 463. Skyman Freighters Limited
- 464. Tepra Logistics Limited
- 465. Venus Kenya Limited
- 466. Skyway Cargo Ltd
- 467. Tham Express Limited
- 468. Verodah Freighters And Logistics Company
- 469. Skyways Logistics
- 470. The Nairobi Clearing House (E.A) Ltd
- 471. Verom Clearing & Forwarding Company Ltd.
- 472. Tiba Freight Forwarders Limited
- 473. Vibgyor Freight Services Limited
- 474. Smart Traders Limited
- 475. Tidal Logistics Limited
- 476. Vibrrasi Enterprises Limited
- 477. Smiles Logistics Limited

