THE EFFECT OF TECHNOLOGY ON SUPPLY DELIVERY OF ONLINE STORES IN KENYA

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DECLARATION

This project is my original work and has not been presented for a degree in any other University

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Signature Date

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ABBREVIATIONS AND ACRONYMS

ICT	Information Communication Technology
LSCM	Logistics in Supply Chain Management
RBT	Resource Based Theory
RFID	Radio Frequency Identification
SCM	Supply Chain Management
SMEs	Small and Medium Enterprises
SOA	Service-Oriented Architecture
ST	Seamless Technology
TAM	Technology Acceptance Model
TMS	Transportation Management Systems
TPT	Transactional Processing Technology

ABSTRACT

Emergence of newer technology innovations and mobile-based technologies has contributed to purchasing power of consumers. The online platforms have increased information penetration and accessibility of goods and services. The study aimed to determine the effect of technology on supply delivery of online stores in Kenya. The study was guided by two objectives: To determine the effect of technology on supply delivery for online stores in Kenya and to determine the challenges facing technology applied for supply delivery for online stores in Kenya. The study was guided by the TAM Model, systems theory and resource based theory. The study adopted descriptive research design in explaining the effect of technology on supply delivery for the online stores in Kenya. The target population of the study was 18 online stores in in Kenya. Since this was a small population, a census was used to sample two managers from each of the 18 online stores and therefore the sample size was 36 respondents. Both primary and secondary data were used in the study. Primary data was collected using a structured questionnaire while secondary data was collected from literature relevant to the study. The study used both descriptive and inferential statistics to analyze data based on the objectives. The study found that a positive effect was found between the types of technology (transportation management system, seamless technology, transactional processing technology and radio frequency identification) and supply delivery. The study concluded that the more the technologies were used in the online stores, supply delivery improved. The study also concluded that supply delivery in the stores was good, though was faced by challenges which hindered effective delivery. The study concluded that the major challenges that faced the online stores were customer ordering products being unresponsive upon delivery of the orders, complains about the period of time taken to deliver the ordered goods, lack of adequate carriers to deliver ordered goods to high costs associated with online supply delivery. The study recommends that the online stores needed to invest more in the transportation management system, seamless technology, transactional processing technology and radio frequency identification technologies to improve their supply delivery. The study also recommends that the stores needed to outsource only the goods and services they lacked and could not be able to provide in their firms to reduce costs. The study suggested that other researchers can undertake a similar study on the same subject in other countries that have online stores for comparison both regionally and globally.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

The development of logistics in the world is fast. Every day there are more industrial and commercial enterprises, having in the governance structure of logistics services (Mangan & Lalwani, 2016). The importance and role of logistics in business over the past few decades have undergone significant changes. With the increasing competition, individualization of markets, growth and formation of new, ever-expanding network of creation cost, logistics continues to grow and become a strategic resource that has already requires a certain level of staff and a variety of in-depth knowledge (Degryse, 2016). Institutions globally use technology to manage most of their function. Technology also facilitates productivity growth in their units. According to Liu, Prajogo and Oke (2016), supply delivery and technology are significant in increasing delivery and resource usage in most institutions.

Supply delivery is defined as an operational handling of the stock from the ordering, mobility, storage and distribution with the overall chain in cyclic (Auramo *et al.,* 2008). It is indeed an important segment in every institution. Supply deliveries are varied in their quantity and quality with differentiated assortment or packaging method and life of usage (Yamoah, 2014). Handling of stock from one point of generation, manufacture or processing to another on delivery then to final consumer, constitutes middle operational units (Oti, 2013; Mongare & Nasidai, 2014).

Supply delivery involves ordering, packaging or repackaging, branding, storage and distribution to the consumers. Globally, institutions have been involved in the supply delivery management segment with various models and systems developed to aid the human management of the deliveries (Oti, 2013). Organizations vary in orders made and this provides the delivery tunes and includes a given storage mechanism. Online stores unlike old and traditional methods that are in practice to date have virtual platform storage for the sales and handling all customer orders (Claudia & Bainson, 2016). Development of technology has added value into the management of the deliveries placed (Mongare & Nasidai, 2014). Virtual platforms are gaining emergence with Amazon.com facing stiff competition from current online stores that have sophisticated models of handling the supply deliveries. Stocks from the suppliers are handled online with outsourced or agents handling the physical storage of the stock. This is crucially providing minimal costs

inclusions and maximizing the profiteering from the handled stock input (Dai & Kauffman, 2001).

Supply delivery management defines growth and operational strength of suppliers and demanders of the goods and services (Shah Alam *et al.,* 2008). Service, processing and manufacturing industries are dependent on supply delivery management to increase their periodic turnovers and going concern in particular sustainability of client base (Nasidai & Mongare, 2014). Retention of clients is a subject of high standard of service delivery and so supply delivery play a critical role in developments (Claudia and Bainson, 2016). Organizations and enterprises have over time with evolutions employed supply delivery management technologies and systems alongside workforce able to facilitate and operationalize the movement of goods and services (Macintosh & Quattrone, 2010). Emergence of globalization in business setting; inventory management modeling by enterprise after other has occasioned immense structuring or review for compatibility with developments for going concern or growth of the enterprises.

1.1.1 Technology in Supply Delivery

Technologies vary in use and concept (Doesburg, 2003). Logistics market and supply industry are using suitable specific technologies (Barua *et al.,* 2001). From administration, reliability and validation in use, organizations and individuals have been accustomed to the use of technology. Technology is a subject of productivity growth and efficiency creation in all processes (Claudia & Bainson, 2016). Substitution of manual labour and cost minimization by technology compliant institutions has seen growth of businesses and operations. Institutions in recent times are more into inclusiveness of technologies despite risks involvement thereon. Online sales are possible by use of technologies that include online interface and back end processing. Goods are ordered online and delivered by human labour. This has drastically reduced high costs inclusiveness.

Globalization has continuously disrupted organization and infrastructural set ups in business (Shah Alam *et al.,* 2008). Supply chain has changed in the operational mechanism with most units in absence. This is however, in maintaining supply and demand relationship. Globalization dictates cost minimization, technology inclusion and minimal physical labour contracting and high strict supervisory modeling to avoid leakages and information distortions. This has been an

added advantage in current global divergent supply means around the globe (Claudia & Bainson, 2016). Global companies in the supply business have either embraced or compelled to change current setting of supply delivery modeling or their going concern is lessened.

Traditional brands in supply deliveries and facilitation over time been coupled with institutional changes and corporate disruptions which have changed the business concepts and planning (Claudia & Bainson, 2016). Technology is a risk resource based item with which will include other virtual costs that are transferred to the next party. Supply delivery of goods and services by technology powered platforms are necessities for globalization element approaches. Efficiency in the supply delivery by virtue of the technology adds to the productivity growth rate from the initial producer of the goods and services (Zailani & Rajagopal, 2005). Various technologies are available to support the online store or supply system. With developed software, desk based, infrastructure reliant and mobility accessibility oriented, the technologies work either in tandem or simultaneously depending on the produced product on the supply chain management (SCM).

Oti (2013) identifies seamless technology, transactional processing and radio frequency identification (RFID) being among the technologies under use. Seamless technology is a cumulative composition of the web based, physical and configured technologies that have interface approach in use (Morgan & O'Donnell, 2015). This implies that the user and provider are on platform based with limited tangibility as compared with the RFID that uses tagged chips (Oti, 2013). Transactional processing is a desk based technologies that work in tandem with online or web based technologies in the processing of documentation of relevant requests (Zailani & Rajagopal, 2005). These technologies are those that undertake processing of online invoice and receipt systems upon payment for services (Oti, 2013). RFID is a chip tag based technology mostly applicable with huge consignment supply. This technology has specific tags placed on the consignment that records and includes the information about the consignment on transit (Oti, 2013). With all in mega usage quantities and in current SCM, these technologies have varied influence on SCM that this study sought to reveal in depth. This study looked into investigating how technology inclusion influences the whole supply delivery of online stores in Kenya.

1.1.2 Supply Delivery

According to Claudia and Bainson (2016), supply delivery is transferring of possession of goods and services to the buyer from the seller over a given period of time per given cost limit. Supply delivery may further mean a chain process of transferring and receipting products or services by the producer or the appointed agent (Zailani & Rajagopal, 2005). Supply delivery is dynamic and progressive (Davilla *et al.,* 2003). Variation in the system use may be the supplied materials and the destination of supply otherwise the client in place. Supply delivery does anchor procedural processes and individual task involvements. How the supply and nature of delivery of a consignment create the continuity in the operational chain in future. Institutional transitivity into current model of supply delivery is critical. This has negative occurrences such as loss of business or other costs related to cancelled partnerships and engagements (Zailani & Rajagopal, 2005).

Physical storage constitutes warehousing, on/underground tank and armories and many more which can be independently managed by private and public firms. Facilities for such storage maybe on lease or fully owned by particular supply firms. Globalization presents outsourcing as the model for cost minimization and which is essential in the equilibrium of activity operations allocation. Regulatory mechanisms in place to operationalize the online stores have also been in the inclusion to also address the risk involvement and other criminal offences that may emanate from the transactions provided (Claudia & Bainson, 2016).

In Africa, supply delivery of goods and services is still on development with inefficiencies and other operational flaws sighted (Barua *et al.,* 2001). With application of the same supply chain and delivery model by most supply firms in Africa, growth of this sector has been growing immensely, however, with stagnation in profits making (Mongare & Nasidai, 2014). Most resources on supply in Africa include household, construction and mining materials and other agricultural products. Services on supply include the professional and other consultancy based contents. However, online stores have been on the increase in providing supply support to the consumers (Claudia & Bainson, 2016). Ease in supply from the online stores, it increases efficiency, customer preferences and relationships, sales growth rates, reduction in costs and facilitates employability of resources through outsourcing. Supply delivery has critical impact on

supplier, end user and nature of delivery. Disutility in supply may induce poor sales performance as converse is true.

1.1.3 Online Stores in Kenya

Kenya has over a decade occasioned online stores. The online stores services include physical storage, the logistical support and merchandizing support agencies. Stores are enduring into the new online systems with which the deliveries made upon the payment of the orders or per agreeable order arrangements for the bulky goods. The application of technology to facilitate the supply delivery is an institutional segment by each to aid the supply of the goods and services required by the customers (Mongare & Nasidai, 2014). Mongare and Nasidai (2014) further posit that the operational nature of the online stores in Kenya being virtual it in addition includes the outsourced logistics firms and individuals that aid the operationalization of the ordered goods to the customers from the warehouses.

The virtual supply delivery is cost effective and creates an ease and consumer friendly pricing aiding growth in sales and within the per capita income of the clients. The technological risks such as hacking the online stores' sites and delays in the transportation of the goods and services to clients illustrate an increase of indirect costing transfer burden to the buyers of the goods and services from the online stores. Among the online stores in Kenya (Appendix 3) include Pigiame, Killmall, Jumia Kenya, OLX Kenya, Cheki, Kenya Car Bazaar, and Buy Rent Kenya.

1.2 Research Problem

Goods and services mobility create a supply chain that contains series of monetary exchanges (Shah Alam *et al.,* 2008). With evolutionary development in the supply of goods and services, online stores supply is compatible with globalization effect around. Online stores supply operate with aim of reducing cost of doing business, depending on technology for facilitation of the supply and employing minimal labour for the supply of good and services. Drastic supply changes present an effect on inventory management by business and enterprises. Adoption of technology presents the risks and other internal unforeseeable effects albeit the efficiency and productivity improvement. Online stores supply with virtual resource pooling and meeting clients' magnitude demand, they are sources of continuous chains and employability of resources

(Mongare & Nasidai, 2014). Indeed, risks and flaws involved with handling bulky data inflows have been on a minimal check (Mongare & Nasidai, 2014).

Emergence of newer technology innovations and mobile-based technologies has contributed to purchasing power of consumers. This is with majority going for affordable goods and services provided on online platforms (Fasanghari *et al.,* 2008). From the households, the motor industry and property sales, online platforms have increased information penetration and accessibility of goods and services from their online ports (Morgan & O'Donnell, 2015). This increase has created customer pool and reduced costs than establishing physical stores and shops (Oti, 2013). Real producers and providers of the goods and services are outsourced or shipped into the country for sales per the orders made (Morgan & O'Donnell, 2015). Online stores are one stop shop for all goods and services. This makes consumers to conduct multiple purchases implying the online store may undertake a single shipment of multiple purchases to a single client.

Globally, Cheema *et al* (2013) studied emergence of online shopping in 21st century as an impact of enjoyment in The Technology Acceptance model (TAM) model. The study found an insignificant perceived trust for online shopping and recommended for demographic awareness and infrastructural development to aid efficiency and delivery processes. However, Cheema *et al* (2013) did not indicate the effect of technology inclusivity on supply delivery. Locally, Barua *et al* (2001) studied the management of e-business transformation as capitalization for available opportunities and value assessment. Findings of the study noted lack of clear infrastructural investments, low online intake and internet use by the service providers and consumers. A study on the effect of information communication technology on inventory systems in transport organization conducted by Mongare and Nasidai (2014) found out that ICT use had an influence in information access, increasing efficiency and verification of the data provided as this further would affect the performance of the organization. However, study never undertook in-depth research on online stores and how supply delivery is affected by technology use.

Online shopping is clearly an emerging supply issue. Inventory systems and customer perceptions rank top in assessing online stores. From the reviewed studies, technology is an efficiency facilitator and reduces business costs with time when adopted. Progressively, delivery of services and stability of online stores in terms of accessibility and usability are covered as

significant for a successful supply chain delivery by studies reviewed. This study recognizes the management and administrative efficiency concern for online supply delivery. Overall organizational and coordination of the online supply units significantly plays a role in ensuring business flow of services. As online businesses are reliant on available technologies to steer their going concern, ample efficiency in inventory systems, addressing environmental challenges and customer satisfaction are a concern to owners of online businesses. Clearly, there exists a gap in the study of the effect of technology on supply delivery processes. Thus, this study sought to fill this gap by answering the question: what is the effect of technology on supply delivery of Online Stores in Kenya?

1.3 Research Objective

i. To determine the effect of technology on supply delivery for online stores in Kenya.
ii. To determine the challenges facing technology applied for supply delivery for online stores in Kenya.

1.4 Value of the Study

The study would be a resource to various parties. The study would be resourceful to players in the supplies and logistics alongside technology fields in the comprehension of the impact they pose to the business environment. It would also add value to the realization of the online stores' contribution to the supply deliveries in terms of logistics, ordering and the mobility alongside the client utility in the usage of the services.

The study would be of great use to the Government of Kenya in particular the policy makers and the regulators of the supply sector. The study outcomes would largely contribute to the knowledge base and critical contributions on the value of online stores and delivery in the supply sector. In addition, the study would offer efficiency input into the regulation reviews of the online stores and supply shops in Kenya.

The study would contribute to the scholarly work as it would act as a reference text to researchers and scholars interested in the online stores and overall supply delivery chain. The study further provided recommendations for areas requiring further studies and in filling the noted gaps in the sector.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter outlined the various theoretical studies and theories formulated that are relevant to the study, the technology aspect in supply delivery and empirical literature review with the summary of the literature and conceptual framework.

2.2 Theoretical Foundation

This section presents theories relevant to the study. Theoretical framework presents a background basis on which the study is founded on a theoretical basis. This study discussed TAM Model, systems theory and resource based theory. This study further linked the theories' relevance to this study.

2.2.1 Technology Acceptance Model

In 1986, TAM theory was formulated by Davis aimed at explaining the perception and workability of a new technology by providers and users (Dai & Kauffman, 2001). This theory asserts that users base their perception on new technologies on the usefulness or ease in using them over a given time period (Davila *et al.,* 2003). Davila *et al* (2003) further posit that the user perception towards the new technology increases with time as and when the technology aids in performing a particular task (or activity) to users. Venkatesh and Davis (2000) argue that the ease of using a system creates a perception effect on a user (for longer use increases the positive attraction wanting to use available technology).

Online stores use a combination of web based and mobile technologies applications. These applications and online technologies are designed in a way they would source customer orders with ease. The easier it is to use a web based technology (or mobile application) the higher the user perception on system effectiveness and efficiency. The TAM model connects with this study in explaining the ease of using the technologies and perception imposition by users of these technologies. Unlike traditional means of shopping, these technologies are tailored into virtual contexts of online shops (as if though it's real physical shopping) for a customer to buy goods and services (Oti, 2013). Technology Acceptance Model is tailored to perceptions held by technology users as this facilitates the design and innovations that could be easily used by the users (Venkatesh & Davis, 2000; Oti, 2013). TAM describes various technologies' usage by the users or the perceptions held by the users when they are using the technologies.

The Technology Acceptance Model was be applied in the study to determine the perceptions held by clients about online shops and payment systems that are facilitated by a combination of technologies. For example, the payment model provided by the online stores was determined if it is compatible with the one the customer has. The theory also helped determine if there was universality of the payment model and how acceptable it is by the shoppers so as to determine the processing of the online orders and the speed of delivery for the goods.

2.2.2 Systems Theory

A system is an operational interconnection of parts reliable in offering a desired service or outcome (Dai & Kauffman, 2001). Ludwing and Bertazlanffy forwarded systems theory in 1968 as the general systems theory. With less technology and complex systems available by then, the theory explains why interlinked parts are subjects of efficiency and effective deliveries (Davila *et al.,* 2003). Davila *et al* (2003) further argue further that in a complex task that requires different parties and resources involved, there has to exist a clear interconnection to succeed. Oti (2013) asserts that for a system to exist, there has to be subsystems available to facilitate efficiency and effectiveness when delivering a given task. In an organization, the subsystems would be specific department or sections such as human resources, accounting, and information management that give a rise to a complex major system (Oti, 2013).

The systems theory was a choice for this study as it captures the operations by online supply delivery shops. The theory helped determine whether there was coordination of different departments in delivering customer orders placed online, and if there were individuals and technologies working to ensure all orders were delivered. The study also helped determine whether the online shops had their own warehouse operations where goods ordered were packaged ready for delivery to client destinations.

2.2.3 Resource Based Theory

Wernefelt (1984) formulated this theory which was then known as Resource Based View in the initial publication. The theory asserts that a firm can adequately brace a lead with clear competitive gain (unlike competitors) by capitalizing the needs of the consumers and sustaining the preferences with supply of resources. The theory argues further that resources can be physical or virtual with some in form of information content usable in making a competitive gain. In recent times, resource mobility and competition is a spread to cater for the needs of a firm (Oti, 2013). This theory notes an interlinking of production units and supply areas is largely dependent on

available resources. This strategy ensures firms are on the lead. Like the Porters Five Forces of strategy, this theory connects well with the modern means of doing business. Firms are embracing technology; resource investment to capitalize on opportunities sighted thus creating a competitive market (Cronin, 2014). This satisfaction orders place by consumers or online customers is a resource to invest in. further, the growth in customer using the technologies requires intensive investment in infrastructure.

This theory matches with this study in terms of how technology influences the supply of goods and services and determines equilibrium in a market. The theory helped the study determine whether the online stores require expensive and highly skilled human capital to facilitate online trading and shopping by customers or vice versa. The theory also helped determine if the stores required intensive training and progressive infrastructural support installations.

2.3 Technology in Supply Delivery

Technology use in production and delivery enhances efficiency and increases productivity output. In this section, technologies considered are Transportation Management Systems (TMS), Seamless Technology (ST), Transactional Processing Technology ((TPT) and Radio Frequency Identification (RFID).

Transportation management system is a type of supply technology that facilitates inventory tracking from dispatch point to the delivery point. Syracuse Staff (2015) opine limited adoption of technology in supply chain, is an easier exit from the current business development. In their analysis, they focused on Warby Parker, Capser, Huckberry, Harry's Razors and Gustins (all online retailers). They argued that success and health of a business organization is dependent on the supply chain in place. The transportation management system (TMS) is one of the technologies used in enhancing the supply delivery. The TMS as a subset of the SCM is a technology that offers reliable facilitation and organization in the Order Management System and Warehouse Management System. The TMS software allows for digitization of data, electronic billing, management and monitoring of the shipment and the with limited errors occurrences (Ramathan *et al.,* 2014). TMS technology enhances ease of shopping and so increases customer utility and retention (Ying *et al.,* 2016). Ying et al (2016) further posit TMS also enhances accountability and reduces the high costs in the logistics industry. TMS is vital in the current globalized world. Adoption of technologies in online businesses has increased performance of sales and deliveries (Tan *et al.,* 2015).

Seamless Technology (ST) is a combination of technologies that work together to facilitate a specified task activity. It is user based and in most cases applicable in back office. It is however interconnected with other technologies or systems to deliver a specified role. Seamless technology is efficient with ability of providing ample boost in huge orders and deliveries (Robinson, 2014). Seamless integrated technology has been in application and provided high margin growth in the delivery system. This is where the shoppers have an opportunity to make more purchases with available connected shopping carts online with ease in tracking, shipment and delivery. This system includes online ordering, invoicing, payment using automated systems and integrated enterprise resource planning systems able to reduce the inefficiencies occasioned in the traditional means of SCM (Robinson, 2014).

Transactional Processing is a technology or technologies that are web based with controls tasked with aiding the various processes involved. Transactional Processing technologies apply in different departments that each individual transaction undergoes until submission of a receipt (Robinson, 2014). For example, online purchases would include submission of credit information processed by the card provider with end the result being confirmation of the funds transfer by the online shop (Robinson, 2014). Online payments for goods and services are facilitated by the transactional processing type of technologies.

Radio Frequency Identification (RFID) is an important SCM technology in the current modern enterprise globe (Qiu *et al.,* 2015). Zhong *et al* (2015) further describe RFID as an innovative technology that has been in progressive development since the World War II. RFID technology uses chips as the information bay and owners of the business are easily capable of tracking their inventory (Li & Ding, 2014). Tan *et al* (2015) noted that chips are computerized to include the product information and are in tags enabling the employees to track anomalies and correct them immediately. RFID is efficient and reduces costs in logistics industry similar as the TMS (Sila, 2013). This technology is highly usable in current modern logistics industry by online stores and retailers (Oti, 2013).

2.4 Empirical Literature Review

Auramo *et al* (2008) studied the roles of information technology in supply chain management objectively focusing on three IT processes: transaction processing, the supply chain planning, collaboration, and the order tracking and delivery coordination based on data from 16 Finish online stores. The study applied descriptive research survey and found out that the three processes

had a significant effect on the SCM and that they differed. However, there is need to investigate variance in the application of the three processes.

Fasanghari *et al* (2008) investigated the impact of Information Technology on Supply Chain Management in Iran automobile industry. Using a fuzzy ranking method, the study analyzed pooled data using descriptive statistics. The findings of the study revealed that technology was influential in determining the strategies, organizational working methods, reduction in costs and created opportunities for expansion and market penetration. However, the study never illustrated clearly the impact of technology on the online stores that incorporates automobile industry. There is therefore need to research further on the supply delivery efficiency by the particular applicable technologies.

Victoria (2013) studied E-Commerce Adoption among Small and Micro Enterprises in Nairobi. The study used descriptive research design and stratified sampling method on 60 respondents and found out that there was a significant relationship in the determinants of e-commerce and the adoption of e-commerce. The study further indicated that enterprises that use e-commerce have an increase in the sales and transaction cost reduction and the processing is on the increase. The study, however, does not provide the technology influence on the supply delivery.

Kabuba (2014) investigated E-Commerce and Performance of Online Businesses in Kenya. The study used a cross-sectional survey research design and observed that most online shoppers had limited trust in shopping online. The study further indicated a positive correlation between the customer to customer e-commerce business model and the performance of the business in particular the repeat ones. The study noted that there existed a high benefits and growth in businesses that have online models for sales. However, the study does not offer in depth insights how the C2C is affected by the supply delivery made.

Morgan and O'Donnell (2015) carried out a study on enabling a ubiquitous and cloud manufacturing foundation with field-level service-oriented architecture (SOA) with objective focus on the service-oriented architecture. Using a descriptive survey method, the study found out that architectural paradigms in the IT sector are in need of adopting sophisticated models for the efficiency in the SCM. The study recommends that manufacturing sector require the SOAs for the effective delivery and configurability with the relevant technologies in the SCM. However, the study did not explain the external impacts of SOAs on the infrastructure in place by the online or manufacturing firms.

Nica (2015) studied Environmentally Sustainable Transport and E-commerce Logistics that adopted conceptual and descriptive research survey. The study objectively looked into the environmental conduct of the transport and related logistics companies, their sustainable performance and social-economic barriers to the sustainable transport system. The findings from the study indicated that technology had greater impact in terms of reliability for performance of the transport and logistics companies thus influencing further their model of operations in the industry. However, the study never looked into the internal controls of the technology's influence on facilitating the e-commerce performance despite looking at the overall environmental conduct.

Tan *et al* (2015) studied the effects of harvesting big data to enhance supply chain innovation capabilities as an analytic infrastructure based on deduction graph. The study objectively focused on the analytic infrastructure, the competence sets and network usability in the mining of data from the online users in the SCM at Company SPEC. Using a case study approach, the study observed that the analytic infrastructure has an impact in decision-making and that the Company SPEC would incorporate its competence sets with others. The study concluded that the particular infrastructure in place would aid sufficient and adequate data processing making the company more competitive in the market thus increasing its supply base. However, the study revealed that data processing requires more in depth study to determine the influence on the supply delivery for the online stores.

Tibbs *et al* (2015) studied e-commerce adoption levels and applications among manufacturing SMEs in Kenya. The study used a survey research design comprising of registered SMEs with the Kenya Industrial Estates Limited sampled 47 firms for observation. The study findings indicated that most firms at 97.9% were using mobile phones in facilitating their transactions and 46.8% were using the computers to undertake their business. The study concluded that most SMEs which have implemented the basic e-commerce applications had a greater performance growth. However, the study did not provide an in-depth insight into how the SMEs enhance their supply delivery to their clients using the e-commerce applications.

Claudia and Bainson (2016) studied the efficient stores management techniques at Takoradi Polytechnic stores department. The study applied descriptive research survey and used qualitative data for analysis. The study found out that efficient stores management has an objective impact on the decision and strategic management of the polytechnic. The study concluded that proper stocking and stores management is significant for operationalization in the supply department. However, there is need to study the technology influence on the stores management in the public institutions or private enterprises.

Dedhia (2016) studied the impact of technology on logistics and supply chain management. The study objectively focused on the various applicable technologies in the SCM that included the communication technology, automatic identification technology and information technology. Based on the secondary data in the Indian perspective, the study found out that technology was a competition changer and highly influenced the performance of business. The study further noted that technology increased the logistical efficiency in the industry and that innovations would guide the future of the logistical industry. Specific technologies by online stores require investigation on the impact they have on supply chain system.

Yu *et al* (2016) undertook a study on E-Commerce logistics in supply chain management as a practice perspective. Using a case study approach, the study explored the online stores in the Americas and United Kingdom analyzing data using inferential statistics. The study found out that e-commerce logistics in supply chain management (LSCM) largely dependent on the numbers and the technology applicable. The study recommended infrastructure installation to aid the efficiency in the e-commerce performance. However, there is a need to study more on the technology tools applicable in influencing the efficient supply system.

2.5 Challenges Facing Online Supply Delivery

In the recent times, newer technologies have been rolled out for use per individual target market. The complications and compatibility of technologies is a concern to online supply firms who are in need of efficient, speedy and quality centred for use. The user adoption to a technology is mainly based on past experiences by other users to place confidence in it (Claudia & Bainsom, 2016). This is common with online payments because customers trust that there deliveries will be made as per the online shop specifications. For example each client may be using different online payment method the online supply shops are expected to have infrastructural support able to accommodate the same for clients shopping on their sites. Online supply shops face the "universality" of technologies as they have to invest in diverse technologies that accommodate customer needs (Li & Ding, 2014). The cost of installing and maintaining technologies that aid the online shops is expensive (Yu et al., 2016). With innovations by the technology providers being rolled out, the online companies are faced with the need to advance in technology. This requires adequate capital to manage the overhead costs and cost cover for installed technologies and other physical infrastructure in place.

Dead stocks is merchandise meant for sale to clients however, due to lack of buyers or rejection by the buyers (in most cases whose orders are undelivered and unpaid) or/and buyers that are

unresponsive to picking their orders on delivery (Yu, et al, 2016). Warehouses handle orders placed online through specific systems or technological support thus facilitating their packaging. Lack of clear concern on specifications by the client, the warehouse handlers may pack different products (in size, weight or colour) against the expectations of the clients' order. Most products that are sold online vary in order specifications inducing re-order or waiting for longer periods for the right orders (Yu *et al.,* 2016)

Online supply stores are mainly virtual in nature, showcasing their products to clients who have access to their shops through the internet or specific mobile applications designed for user's use. The online shops contain specifications for each product (Li & Ding, 2014). The specifications are price attached to the product, discount (if any), source, manufacturer or producer of a particular product, time limit for shipment of a product, warranty for attached to a product and intellectual patent or trademarks for each product. However, online shops face undisclosed challenges in terms of time taken to obtain a product whose order is placed to reach the warehouse and repackaged for delivery to a client (Li & Ding, 2014). Products especially the perishable ones undergo specific packaging thus may lengthen the supply timing if they are inadequate or not ready for sale. In other instances, products delivered to clients or shops selling products online may not be specifically as per orders placed. This implies that supply process will be initialized as the rejected supply is returned to the supplier. Inconveniences of such occurrences may lead to withdrawal of an order and presenting an odd client service. Further, costs for the process maybe unrecovered as this may too lead to dead stocks in place (Li & Ding, 2014).

Selling online products and services requires content licenses and other internet or intellectual property related authorizations. These regulatory measures are in place to safeguard the rights of the shoppers and facilitate the business legitimacy in the area of operation. However, most of the regulatory measures are punitive in nature and sensitive to the business growth in terms of taxation and government concerns over avoidance of taxes. This is in breach of the business facilitation rather the censorship may lead to slow growth of the online business considering the costs a business has to incur to make a profit (Yu *et al.,* 2016).

2.6 Summary of the Literature Review

The summary of the literature review is as tabulated in the table 2.1.

Table 2.1 Summary of the Literature Review and Research Gaps

Author	Focus of Study	Methodology	Major Findings	Major Contribution	Knowledge Gap
Fasanghari, Roudsari and Kamal (2008)	The impact of Information Technology on Supply Chain Management in Iran automobile industry.	Fuzzy ranking method	Technology influenced the performance of the automobile industry to greater margins Reduction in costs	Work Organization and Mobility of resources	Lack of supply delivery on online based platforms by the automobile industry
Atema (2014)	E-Commerce Adoption among Small and Micro Enterprises in Nairobi	Descriptive Research Survey	Increased sales Installation of technology	E-Commerce Aids the growth of SMEs	No clear investigation on the e-commerce effect on the supply delivery by the SMEs
Kabuba (2014)	E-Commerce and Performance of Online Businesses in Kenya	Cross-sectional survey	Increased business growth Online Business Behaviour Changes	E-Commerce contributes to performance of online business	No clear investigation on the e-commerce effect on the online supply delivery by the SMEs
Morgan and O'Donnell (2015)	Relationship of ubiquitous and cloud manufacturing foundation with field-level service-oriented architecture (SOA)	Descriptive Research Survey	SOAs have an impact on the manufacturing company performances	Architectural development in the IT sector	Unclear description on external control impacts
Nica (2015)	Environmentally Sustainable Transport and Ecommerce Logistics	conceptual and descriptive research survey	Environmental conduct of the transport and related logistics companies is dependent on technology	Environmental influence on sector sustainability	Lack of internal IT control's influence on the sector

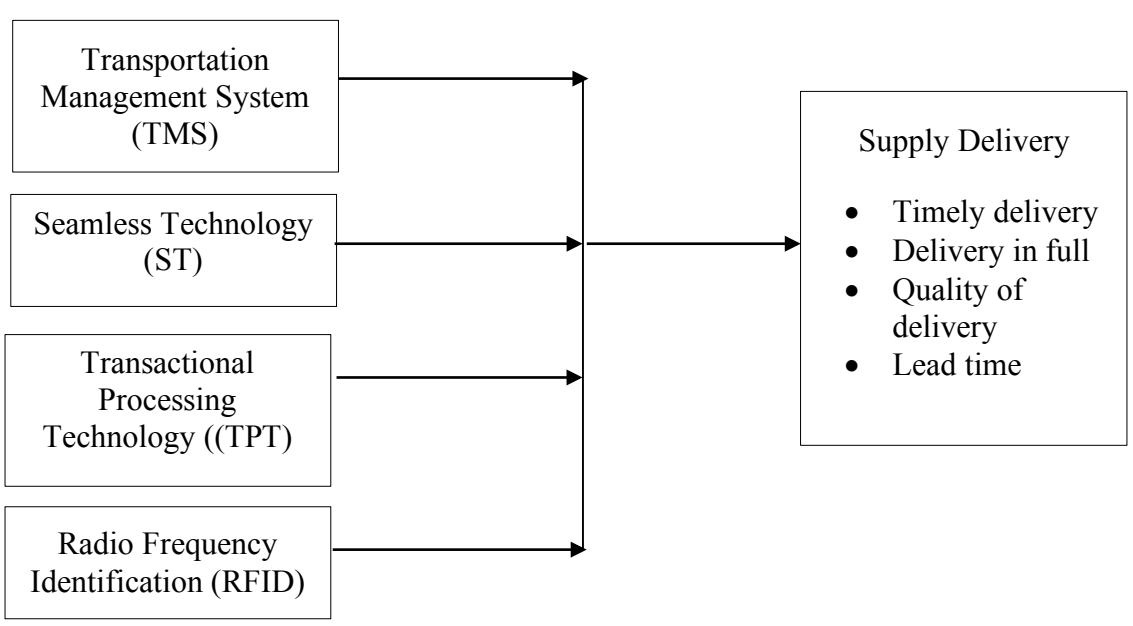
Tanskanen et al (2008)	Roles of information technology in supply chain management	Descriptive Research design	transaction processing, the supply chain planning, collaboration, and the order tracking and delivery differed	Coordination of transaction processing, the supply chain planning, collaboration, and the order tracking and delivery coordination	Variance in the application on the online stores supply delivery perspective
Tan, Zhan, Ji, Ye and Chang (2015)	Harvesting big data to enhance supply chain innovation capabilities as an analytic infrastructure	Case Study Approach	Proper processing of data aids competitiveness	Data mining significance in the delivery of supplies or determination of supply trends in the industry	No clear influence indication on the online stores or suppliers
Claudia and Bainson (2016)	Efficient stores management in public institutions	Descriptive research survey & Qualitative Approach	Efficiency management influenced managerial decisions	Stores performance in the public sector	Lack of technology inclusion in the stores management
Dedhia (2016)	impact of technology on logistics and supply chain management	Descriptive Research Survey	Technology Increased Competition Reduction in Costs	IT, Communication Technology and Automation Technology influence supply performance	Lack of illustration on online stores technology performance and supply delivery
Yu, Wang, Zhong and Huang (2016)	E-Commerce Logistics in Supply Chain Management	Case Study Approach	Reliability of technology for LSCM performance	e-commerce is dependent on numbers for supply efficiency	Lack of specific tools facilitating the performance

Source: Researcher (2017)

2.7 Conceptual Framework

The study sought to investigate the relationship between the independent variables and dependent variable. Independent variables were technologies under consideration by the study that are: Transportation Management Systems (TMS), Seamless Technology (ST), Transactional Processing Technology (TPT) and Radio Frequency Identification (RFID) against dependent variable which was supply delivery. This is illustrated in the figure 2.1 below.

Figure 2.1 Conceptual Model



Source: Researcher (2017)

Null Hypothesis, Ho: There is no relationship between technology and online supply delivery in Kenya.

CHAPTER THREE: RESEARCH METHODOLOGY

This chapter sought to outline clearly the appropriate methods to use in conducting the research. It provided the design, target population, the method of data collection and analysis of data.

3.1 Research Design

This study adopted a descriptive research design. This is because the study sought to ascertain the manner, phenomenon, elements and knowledge in the demographic settings. According to Orodjo (2005), a descriptive research design is appropriate when studying phenomenon in the demographic settings. The study therefore used a descriptive research design to explain in depth the attitudes, beliefs and available knowledge about the effect of technology on the supply delivery of online stores in Kenya. The study also adopted the design to help discuss the overall supply chain system including the buyers and sellers who are key party players.

3.2 Study Population

There are 18 online stores in Kenya (Appendix III). Since this is a small population, a census was done.

3.3 Data Collection

The study used both primary and secondary data. Primary data was collected using a structured questionnaire while secondary data was collected from literature relevant to the study. This study used Likert scale based questions in the questionnaire to measure the extent of magnitude for various elements or items. The questionnaire (see appendix II) had four sections: Section A that had demographic information; Section B was the extent of implementation of technologies considered by this study, Section C queried on the challenges facing the online supply delivery while Section D contained questions on supply chain delivery. The study respondents were the managers tasked with customer supplies and information technology areas of the online supply stores. There are 36 managers in the customer supplies and information technology sections in the online stores in Kenya, who formed the sample of the study. This study used “drop-and-pick later” method in the questionnaire distribution.

3.4 Data Analysis

The first objective of the study was to determine the effect of technology on supply delivery for online stores in Kenya. The second objective was to determine the challenges facing technology applied for supply delivery for online stores in Kenya. Demographic data on the gender of the respondents, their age bracket, academic/professional background and the length of service in the organizations was also sought in the study.

The study used regression analysis to address the effect of technology on supply delivery for online stores in Kenya. This was in line with the first objective. The study also used descriptive statistics to determine the challenges facing supply delivery of online stores in Kenya. Descriptive statistics that were used included frequencies, percentages, means and standard deviations. The study adopted a multiple linear regression model to measure the relationship between the variables.

The multiple linear regression model was as follows:

$$\mathbf{Y=\alpha+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_4+\varepsilon}$$

Where **Y** is the supply delivery,
α is the autonomous function,
$\beta_1, \beta_2, \beta_3, \beta_4$ is the slope of the function of each function attribute,
X_1 is the Transportation Management Systems (TMS);
X_2 is the Seamless Technology (ST);
X_3 is the Transactional Processing Technology ((TPT);
X_4 is the Radio Frequency Identification (RFID) technology and **ε** is the error term.

Each of the study objectives was analyzed as shown in Table 3.1.

Table 3.1 Summary of Data Collection and Data Analysis

Objective	Data Collection Method	Analysis Method
Demographic Data	Questionnaire	Descriptive Statistics
To determine the effect of technology on supply delivery for online stores in Kenya	Questionnaire	Regression Analysis
To determine the challenges facing supply delivery for online stores in Kenya	Questionnaire	Descriptive statistics

Source: Researcher (2017)

CHAPTER FOUR : DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents an analysis of data, interpretation and discussion of the findings. Presentations of the results are on tables and figures where appropriate. The chapter has been organized into response rate, demographic characteristics of the respondents, descriptive results on technology and supply delivery, inferential statistics on the effect of technology on supply delivery, challenges facing technology applied in supply delivery and the discussions of the results.

4.2 Response Rate

The section presents the results on the response rate. This is an illustration of the response rate from the respondents who were sampled as a representative of the target population as presented in Table 4.1;

Table 4.1 Response Rate

	Frequency	Percentage
Returned Questionnaires	31	86%
Unreturned Questionnaires	5	14%
Total	36	100%

Source: Research data (2017)

The researcher targeted a sample of 36 managers from the online stores in Kenya. Out of the 36 responses targeted, 31 gave adequate information. However, 5 respondents did not give response to the study making a non-response of 14%. Thus, the study realized a response rate of 86% as shown in Figure 4.1. According to Mugenda and Mugenda (2003) a response rate of 50 % is adequate, 60 % is good and above 70% is very good. The response rate obtained in the study was therefore very good.

4.2 Demographic Characteristics of the Respondents

The section gives the study findings on the demographic characteristics of the respondents. The characteristics include the gender of the respondents, their age bracket, academic/professional background and the length of service in the organizations.

4.2.1 Gender of Respondents

The study sought to determine the gender of the respondents who participated in the study.

Table 4.2 Gender of Respondents

	Frequency	Percentage
Male	19	61%
Female	12	39%
Total	31	100%

Source: Research data (2017)

The findings obtained in the study indicate that 61% of the respondents were male while 39% were female as shown in Table 4.2. Therefore, the online stores in Kenya have employed more male in the management of supplies and information technology, The findings imply that most of the managers in the online stores are male.

4.2.2 Age of Respondents

The study sought to determine the age of the respondents who participated in the study. The findings are shown in Table 4.3.

Table 4.3 Age of Respondents

	Frequency	Percentage
20-25 Years	2	6%
26-35 Years	2	6%
36-45 Years	15	49%
46 years or more	12	39%
Total	31	100%

Source: Research data (2017)

The findings on the age of the respondents indicate that 49% of the respondents were aged 36-45 years, 39% were aged 46 years and above, 6% were aged 26-35 years while 6% were aged 20-25 years. The findings are shown in Table 4.3. These findings imply that most managers in the online stores have more than 35 years, which suggest that the online stores might consider employing those with less than 35 years in the future to involve the youth more in the leadership positions.

4.2.3 Academic/Professional Background of Respondents

The study sought to determine the academic/professional background of the respondents who participated in the study. The findings are shown in Table 4.4.

Table 4.4 Respondent Academic/Professional Background

	Frequency	Percentage
College level	3	9.7
University level	11	35.5
Professional level	17	55%
Total	31	100%

Source: Research data (2017)

The findings on the academic/professional background indicate that 55% of the respondents were on professional level, 35% had attained university education and 10% had college education as shown in Table 4.4. The findings imply that the managers were mainly professionals in the online stores in Kenya; hence reliable information was obtained in the study.

4.2.4 Length of Service of Respondents

The study sought to determine the length of time the respondents had worked in their organizations. The findings are shown in Table 4.5.

Table 4.5 Length of Service in the Organization

	Frequency	Percentage
Less than 1 Year	5	16%
2-5 Years	13	42%
6-10 Years	7	23%
Above 15 Years	6	19%
Total	31	100%

Source: Research data (2017)

The findings obtained indicate that 42% of the respondents had served in the online stores for 6-10 years, 23% had worked for 2-5 years, 19% had worked for more than 15 years while 16% had worked for less than 1 year. The findings imply that the managers had considerable experience in their current institutions, shown by the years they have worked for the stores and therefore the information collected could be relied upon.

4.3 Technology and Supply Delivery

The study sought to determine the effect of technology on supply delivery of the online stores in Kenya. The findings of the study illustrate the agreement level of the respondents on the statements given. The findings are on means and standard deviation obtained from a 5-point Likert scale. Based on the scale, a mean in the interval of 0.1 – 0.9 indicates strongly disagree responses, 1.0 – 1.9 indicates disagree responses, 2.0 – 2.9 is undecided, 3.0 – 3.9 is agree and 4.0 – 4.9 is strongly agree. The standard deviations measured the level of variance in the responses indicating the deviation from the actual mean.

Table 4.6 Results on Transportation Management System

	N	Mean	Std. Deviation
TMS has increased new delivery capabilities	31	4.26	.514
TMS has improved time of delivery of products from suppliers to the warehouse	31	4.13	.562
TMS has increased portfolio performance of your department or section	31	3.94	.727
TMS has led to delivery cash flow improvements	31	3.90	.831
TMS has improved customer service in the warehouse and therefore improved delivery of goods	31	3.81	.654
TMS has led to inventory reductions associated with delivery	31	3.77	.762
TMS has increased the logistical mobility of products from suppliers to warehouse to clients	31	3.74	.773

Source: Research data (2017)

The findings obtained in the study indicate that the majority of the respondents strongly agreed that TMS has increased new delivery capabilities (M = 4.26, SD = 0.514) and that TMS has improved time of delivery of products from suppliers to the warehouse (M = 4.13, SD = 0.562). The respondents also agreed that TMS has increased the logistical mobility of products from suppliers to warehouse to clients (M = 3.74, SD = 0.773); TMS has improved customer service in the warehouse and therefore improved delivery of goods (M = 3.81, SD = 0.654); TMS has led to delivery cash flow improvements (M = 3.90, SD = 0.831); TMS has led to inventory reductions associated with delivery (M = 3.77, SD = 0.762) and that TMS has increased portfolio performance of your department or section (M = 3.94, SD = 0.727). The standard deviations obtained were all less than 1 indicating that the responses had less variation from the mean value obtained. The findings on transport management system are shown in Table 4.6.

Table 4.7 Results on Seamless Technology

	N	Mean	Std. Deviation
ST has improved innovation in the delivery of goods	31	4.16	.688
The firm has led to the stores' ability to react quicker to trends in the market related to supply chain	31	4.10	.700
ST has led to saving of supply chain costs in the firm	31	4.06	.727
ST has led to reduced labour costs associated with delivery in the warehouse	31	3.94	.727
ST has improved the interactions of employees in the supply chain department	31	3.84	.583
ST has improved the quality of products offered by the store	31	3.84	.779

Source: Research data (2017)

The findings indicate that the respondents strongly agreed that ST has improved innovation in the delivery of goods (M = 4.16, SD = 0.688); the firm has led to the stores' ability to react quicker to trends in the market related to supply chain (M = 4.10, SD = 0.700) and that ST has led to saving of supply chain costs in the firm (M = 4.06, SD = 0.727). The respondents also agreed that ST has led to reduced labour costs associated with delivery in the warehouse (M = 3.94, SD = 0.727); ST has improved the interactions of employees in the supply chain department (M = 3.84, SD = 0.583) and that ST has improved the quality of products offered by the store (M = 3.84, SD = 0.779). The findings are shown in Table 4.7.

Table 4.8 Results on Transactional Processing Technology

	N	Mean	Std. Deviation
TPT has been instrumental in improving the supply delivery of goods and services	31	4.10	.746
TPT has led to reduced inventory in the store	31	4.03	.605
There has been a reduction in losses related to supply delivery since TPT was installed and commenced operations	31	3.97	.605
Transaction Processing Technology has led to a reduction in personnel and ordering costs	31	3.97	.605
TPT has led to improved customer satisfaction due to fast delivery	31	3.90	.539
TPT has led to improved productivity in the supply chain department	31	3.87	.670
TPT has led to a reduction in processing time, lead time and order cycle time	31	3.84	.735

Source: Research data (2017)

The respondents further strongly agreed that TPT has been instrumental in improving the supply delivery of goods and services ($M = 4.10$, $SD = 0.746$) and that TPT has led to reduced inventory in the store ($M = 4.03$, $SD = 0.605$). The study also determined that the respondents agreed to the following statements: There has been a reduction in losses related to supply delivery since TPT was installed and commenced operations ($M = 3.97$, $SD = 0.605$); Transaction Processing Technology has led to a reduction in personnel and ordering costs ($M = 3.97$, $SD = 0.605$); TPT has led to improved customer satisfaction due to fast delivery ($M = 3.90$, $SD = 0.539$); TPT has led to improved productivity in the supply chain department ($M = 3.87$, $SD = 0.670$); and that TPT has led to a reduction in processing time, lead time and order cycle time ($M = 3.84$, $SD = 0.735$). The findings are shown in Table 4.8.

Table 4.9 Results on Radio Frequency Identification

	N	Mean	Std. Deviation
RFID has been instrumental in improving the supply delivery trust from clients	31	4.00	.683
RFID has improved the speed and convenience of reading tags with greater precision in the firm hence saves time related to delivery of products	31	4.00	.688
There has been an increased level of storage of information especially with regards to assets, inventories, and equipment through use of RFID which has improved delivery	31	3.97	.752
RFID has increased the portfolio sale of products	31	3.94	.629
RFID has led to reduction in labour costs associated to delivery and improved efficiency in the firm	31	3.87	.718
RFID has improved the security and privacy of the store, hence supplies and customers feel safer working with the store	31	3.84	.688
RFID has improved the process of reading tags from a greater distance in the firm hence improved delivery process	31	3.77	.805

Source: Research data (2017)

The results obtained in the study indicate that the majority of the respondents agreed that RFID has been instrumental in improving the supply delivery trust from clients (M = 4.00, SD = 0.683); RFID has improved the speed and convenience of reading tags with greater precision in the firm hence saves time related to delivery of products (M = 4.00, SD = 0.688); There has been an increased level of storage of information especially with regards to assets, inventories, and equipment through use of RFID which has improved delivery (M = 3.97, SD = 0.752); RFID has increased the portfolio sale of products (M = 3.94, SD = 0.629); RFID has led to reduction in labour costs associated to delivery and improved efficiency in the firm (M = 3.87, SD = 0.718); RFID has improved the security and privacy of the store, hence supplies and customers feel safer

working with the store (*M* = 3.84, *SD* = 0.688) and RFID has improved the process of reading tags from a greater distance in the firm hence improved delivery process (*M* = 3.77, *SD* = 0.805). The findings obtained are shown in Table 4.9.

Table 4.10 Supply Delivery of Online Stores

	N	Mean	Std. Deviation
Goods are delivered on time in the store	31	4.06	.727
Goods are delivered in the desired quality in the store	31	4.03	.795
There are no lead-time variance metrics in the store	31	4.03	.657
Goods are delivered in full in the store	31	4.00	.683
The goods ordered are the goods received/delivered from/to suppliers/customers	31	3.90	.831

Source: Research data (2017)

The study also sought to determine the supply delivery of the online stores studied in Kenya. The findings obtained indicate that the majority of the respondents strongly agreed that goods were delivered on time in the store (*M* = 4.06, *SD* = 0.727); goods were delivered in the desired quality in the store (*M* = 4.03, *SD* = 0.795) and that there were no lead-time variance metrics in the store (*M* = 4.03, *SD* = 0.657). The respondents also agreed that goods were delivered in full in the store (*M* = 4.00, *SD* = 0.683) and that the goods ordered were the goods received/delivered from/to suppliers/customers (*M* = 3.90, *SD* = 0.831). The findings are shown in Table 4.10.

4.4 Effect of Technology on Supply Delivery

The study used regression analysis to determine the effect of technology on supply delivery of the online stores. The coefficients of regression, model summary and ANOVA table were derived to help explain the relationships that existed between the technology and supply delivery.

Table 4.11 Coefficients Table

Model		Unstandardized Coefficients		Standardized Coefficients	t/z	Sig.
		B	Std. Error	Beta		
1	(Constant)	.722	.844		6.855	.000
	Transportation Management Systems (X_1)	.427	.209	.447	6.042	.001
	Seamless Technology (X_2)	.052	.196	.053	3.264	.014
	Transactional Processing Technology (X_3)	.091	.256	.073	5.356	.005
	Radio Frequency Identification (X_4)	.250	.206	.227	4.210	.007

a. Dependent Variable: Supply Delivery

Source: Research data (2017)

The linear equation for the study was:

Y= 0.722 + 0.427X1 + 0.052X2 + 0.091X3 + 0.250X4

The findings shown in Table 4.11 indicate that all the variables had a positive and significant effect on supply delivery. This is because all the t/z values obtained in the study were above 1.96. The p values were also significant as the values for all variables were below 0.05. According to the results, transport management systems had a significant influence on supply delivery as shown by coefficients (β = 0.447, z = 6.042, p = 0.001). Seamless technology also showed significant relationship with supply delivery as shown by coefficients (β = 0.053, z = 3.264, p = 0.014); similar to transactional processing cost (β = 0.073, z = 5.356, p = 0.005) and radio frequency identification (β = 0.227, z = 4.210, p = 0.007).

Therefore, based on the Hypothesis: Ho: There is no relationship between technology and online supply delivery in Kenya; the study rejects null hypothesis and affirms that there is a positive significant relationship between technology and online supply delivery in Kenya.

The findings obtained in the study imply that for every unit increase in transportation management system, supply delivery increases by 42.7%; for every unit increase in seamless

technology, supply delivery improves by 5.2%; for every unit increase in transactional processing technology, supply delivery increases by 9.1% and for every unit increase in radio frequency identification, supply delivery increases by 25%. The findings of the study were therefore positive.

Table 4.12 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.940[a]	.810	.119	.173

a. Predictors: (Constant), Radio Frequency Identification, Transportation Management Systems, Seamless Technology, Transactional Processing Technology

Source: Research data (2017)

As illustrated in the Table 4.12, the predictor variables (radio frequency identification, transportation management systems, seamless technology, and transactional processing technology) explain 81% of the variation in supply delivery in the online stores in Kenya. This is as given by the R square coefficient with a value of 0.810. Thus, based on this coefficient, other factors that were not considered in this research contribute to 19% of the variability in supply delivery in online stores in Kenya.

Table 4.13 ANOVA Table

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.517	4	.629	4.514	.007[b]
	Residual	3.625	26	.139		
	Total	6.142	30			

a. Dependent Variable: Supply Delivery

b. Predictors: (Constant), Radio Frequency Identification, Transportation Management Systems, Seamless Technology, Transactional Processing Technology

Source: Research data (2017)

As illustrated in the Table 4.13, the significance value in testing the reliability of the model for the relationship between radio frequency identification, transportation management systems,

seamless technology, and transactional processing technology was obtained as 0.007 which is less than 0.05 the critical value at 95% significance level. Therefore, the model is statistically significant in predicting the relationship between the dependent and independent variables of the study. The F value from the table is 4.514 indicating a significant model for the relationship as given by the regression coefficients.

4.5 Challenges Facing Technology Applied for Supply Delivery for Online Stores

The study sought to determine the challenges facing technology applied for supply delivery for online stores.

Table 4.14 Challenges facing Technology in Online Stores

	N	Mean	Std. Deviation
In your organization, the customer ordering products are unresponsive upon delivery of the orders	31	4.03	.605
The customers complain of using your online applications	31	3.90	.746
Customers complain about the period of time taken to deliver the ordered goods	31	3.81	.601
It is expensive to outsource different suppliers for goods and services to be sold online	31	3.81	.601
It is expensive to outsource the transport services to facilitate the transportation of orders supplies to clients	31	3.77	.717
There is lack of adequate carriers to deliver ordered goods to clients	31	3.71	.529
The customers change preferences and return goods upon delivery	31	2.97	.605
In your organization, there is an increase in customer dissatisfaction of the services offered	31	2.84	.735

Source: Research data (2017)

The findings obtained indicate that the majority of the respondents strongly agreed that in their organizations, the customer ordering products were unresponsive upon delivery of the orders (M = 4.03, SD = 0.605). The respondents also agreed that the customers complained of using online applications (M = 3.90, SD = 0.746); the customers complained about the period of time taken to deliver the ordered goods (M = 3.81, SD = 0.601); it is expensive to outsource different suppliers for goods and services to be sold online (M = 3.77, SD = 0.718); and there was lack of adequate

carriers to deliver ordered goods to clients (M = 3.71, SD = 0.529). The respondents however neither agreed nor disagreed that the customers changed preferences and returned goods upon delivery (M = 2.97, SD = 0.718); and that in their organizations, there was an increase in customer dissatisfaction of the services offered (M = 2.84, SD = 0.735).

4.6 Discussions

The study found out that transportation management system (TMS) was an important component of technology in the online stores for improved supply delivery. In line with the findings of the study, Ramathan *et al.* (2014) determined that TMS was one of the technologies used in enhancing the supply delivery. The authors determined that TMS allows for digitization of data, electronic billing, management and monitoring of the shipment and the with limited errors occurrences. The present study found that TMS technology enhances ease of shopping and so increases customer utility and retention. In line with these findings, Ying *et al.* (2016) agrees that TMS enhances accountability and reduces the high costs in the logistics industry. This improves performance of sales and deliveries.

The study determined that seamless technology was an important technology in improving supply delivery in the online stores in Kenya. Robinson (2014) agrees with these findings when the study found that seamless technology was efficient with ability of providing ample boost in huge orders and deliveries. This includes payment using automated systems, online ordering, invoicing and integrated enterprise resource planning systems able to reduce the inefficiencies occasioned in the traditional means of supply delivery.

This study further determined that transactional processing technology was important in the online stores in Kenya. Tan *et al*. (2015) support the findings of this study that transactional processing technologies such as online payments for goods and services are facilitated by the transactional processing type of technologies. Radio frequency identification was also a major component of technology in the stores as it increased supply delivery in the stores. Qiu *et al.* (2015) and Zhong *et al.* (2015) agree that radio frequency identification is efficient and reduces costs in logistics industry. The authors also noted that this technology is highly usable in current modern logistics industry by online stores and retailers, which was also found to be case in Kenya.

Overally, the study found that technology in the online stores had improved supply delivery. The findings of Dedhia (2016) are similar with the findings of the study when he determined that communication technology, automatic identification technology and information technology were very important elements in supply delivery. Dedhia (2016) also noted that technology overally increased the logistical efficiency in the industry. Similar findings were also similar to those of Claudia and Bainsom (2016) who determined a positive relationship between technology and supply delivery.

The study determined that a number of challenges affected the online stores during supply delivery. One of the challenges was the cost of technologies which was found to be expensive. This finding align with the finding of Yu *et al*. (2016) who determined that the cost of installing and maintaining technologies that aid the online shops was expensive in Asia. The findings of Li ad Ding (2014) indicate that online shops faced undisclosed challenges in terms of time taken to obtain a product whose order is placed to reach the warehouse and repackaged for delivery to a client. In line with the findings of this study, the study found that customers complained about the period of time taken to deliver the ordered goods in the online stores in Kenya. Costs were a major hindrance in supply delivery in the online stores in Kenya. Supporting these findings, Li and Dong posited that costs for the process maybe unrecovered as this may too lead to dead stocks in place, which could reduce supply delivery.

CHAPTER FIVE : SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter gives the summary of the main findings, the discussions and the conclusions that were made in the study based on the findings. The chapter also presents the recommendations for improvement as well as the recommendations for future studies.

5.2 Summary of the Findings

The study found that Transportation Management System (TMS) has been used in the online stores which has increased the logistical mobility of products from suppliers to warehouse to clients and has improved customer service in the warehouse and therefore improved delivery of goods. TMS was mostly important in the improvement of time of delivery of products from suppliers to the warehouse and increasing new delivery capabilities. The study also found that TMS had a significant positive effect on supply delivery of online stores in Kenya.

The study also found that Seamless Technology (ST) was used in the online stores in Kenya which had led to the stores' ability to react quicker to trends in the market related to supply chain, improve innovation in the delivery of goods and save supply chain costs in the firms. The findings of the study also indicated that ST had a positive significant effect on supply delivery of online stores.

Further, the study findings indicated that Transactional Processing Technology (TPT) was important in the online stores for reducing losses related to supply delivery, improving productivity and customer satisfaction due to fast delivery as well as reducing personnel and ordering costs. TPT was instrumental in improving the supply delivery of goods and services and reducing inventory in the stores. A significant positive relationship was also obtained between TPT and supply delivery of online stores.

Radio Frequency Identification (RFID) was also an important factor in improving the supply delivery trust from clients, increasing the portfolio sale of products and increasing the level of storage of information especially with regards to assets, inventories, and equipment. FFID also had a positive significant effect on supply delivery of online stores in Kenya.

The study found that there were challenges that affected the online stores during supply delivery. Major challenges determined by the study were customer ordering products being unresponsive upon delivery of the orders and complains from the customers about the period of time taken to deliver the ordered goods.

5.3 Conclusion

Based on the findings of the study, the study made the following conclusions.

The study concluded that technology was an important factor in the supply delivery of online stores in Kenya. A positive effect was found between the types of technology (transportation management system, seamless technology, transactional processing technology and radio frequency identification) and supply delivery. The study concluded that the more the technologies were used in the online stores, supply delivery improved.

The study also concluded that supply delivery in the stores was good, though was faced by challenges which hindered effective delivery. The study concluded that the major challenges that faced the online stores were customer ordering products being unresponsive upon delivery of the orders, complains about the period of time taken to deliver the ordered goods, lack of adequate carriers to deliver ordered goods to high costs associated with online supply delivery.

5.4 Recommendations from the Study

The study recommends that the online stores need to invest more in the transportation management system, seamless technology, transactional processing technology and radio frequency identification technologies to improve their supply delivery.

The study recommends that the stores need to devise ways to ensure that the customers do not complain about the period of time taken to deliver the goods ordered. This could be done by investing more in transportation management systems and devising more carriers to deliver ordered goods to clients.

The study found that stores faced cost related problems in outsourcing different suppliers for goods and stores. The study recommends that the stores need to outsource only the goods and services they lack and cannot be able to provide in their firms. This could help reduce costs related to outsourcing of unnecessary and unwanted goods and services.

The study recommends that there also need to be a regulatory framework guiding the operations of the online stores. The framework will be important in ensuring that costs related to online delivery are regulated and therefore reduce unnecessary losses such as outsourcing costs.

5.5 Limitations of the Study and Suggestions for Future Research

Despite following an exhaustive research method and carrying out rigorous data analysis, however, the study experienced limitations which serve as suggestions for future research as follows: The study was limited to the online stores in Kenya, and therefore other types stores were not studied. Therefore, the scope of generalization is limited to the study area. Therefore, the study suggests that other researchers can undertake a similar study on the same subject in other countries that have online stores for comparison both regionally and globally. In addition, the study used quantitative approaches in data collection and analysis. Therefore, other researchers can undertake a similar study using qualitative approaches.

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APPENDICES

Appendix I: Letter of Introduction

TO WHOM IT MAY CONCERN.

Dear Sir/Madam,

RE: RESEARCH ASSISTANCE

I **MUTUKU LUCY MWIKALI: D61/77239/2015,** a postgraduate Master of Business Administration (Supplies Management Option) student at the University of Nairobi conducting a research study titled **"*The Effect of Technology on Supply Delivery for Online Stores in Kenya*"** do hereby request for your assistance in the filling of the questionnaire to facilitate the study conclusion.

Thank you for your consideration.

Sincerely
MUTUKU LUCY MWIKALI
Reg. No: D61/77239/2015
Supervisor's Name
MICHAEL K. CHIRCHIR

Appendix II: Questionnaire

This questionnaire is geared to facilitating the research on "*The Effect of Technology on Supply Delivery for Online Stores in Kenya*" thus your support in answering will be greatly appreciated.

SECTION A: Demographic information

What is your gender?

a) Male [ ]
b) Female [ ]

What is your age bracket?

a) 20-25 Years [ ]
b) 26-35 Years [ ]
c) 36-45 Years [ ]
d) Above 46 Years [ ]

What is your academic/professional background level?

a) Secondary Level [ ]
b) College Level [ ]
c) University Level [ ]
d) Professional Level [ ]
e) Other [Specify]……..

How long have served in your organization?

a) Less than 1 Year [ ]
b) 2-5 Years [ ]
c) 6-10 Years [ ]
d) Above 15 Years [ ]

SECTION B: EFFECT OF TECHNOLOGY

In the scale of 5=Strongly Disagree, 4=Disagree, 3=Neutral, 2=Agree, 1=Strongly Agree, to what extent has technology affected supply delivery of your store?

Transport Management System	**1**	**2**	**3**	**4**	**5**
TMS has increased the logistical mobility of products from suppliers to warehouse to clients					
TMS has improved time of delivery of products from suppliers to the warehouse					
TMS has improved customer service in the warehouse and therefore improved delivery of goods					
TMS has led to delivery cash flow improvements					
TMS has led to inventory reductions associated with delivery					
TMS has increased new delivery capabilities					
TMS has increased portfolio performance of your department or section					
Seamless Technology (ST)	**1**	**2**	**3**	**4**	**5**
ST has improved the supply delivery of goods and services					
The firm has led to the stores' ability to react quicker to trends in the market related to supply chain					
ST has improved the interactions of employees in the supply chain department					
ST has improved the quality of products offered by the store					

ST has improved innovation in the delivery of goods					
ST has led to saving of supply chain costs in the firm					
ST has led to reduced labour costs associated with delivery in the warehouse					
Transaction Processing Technology (TPT)	**1**	**2**	**3**	**4**	**5**
TPT has been instrumental in improving the supply delivery of goods and services					
There has been a reduction in losses related to supply delivery since TPT was installed and commenced operations					
TPT has led to improved productivity in the supply chain department					
TPT has led to improved customer satisfaction due to fast delivery					
TPT has led to reduced inventory in the store					
Transaction Processing Technology has led to a reduction in personnel and ordering costs					
TPT has led to a reduction in processing time, lead time and order cycle time					
Radio Frequency Identification (RFID)	**1**	**2**	**3**	**4**	**5**
RFID has been instrumental in improving the supply delivery trust from clients					
RFID has improved the process of reading tags from a greater distance in the firm hence improved delivery process					
RFID has increased the portfolio sale of products					

There has been an increased level of storage of information especially with regards to assets, inventories, and equipment through use of RFID which has improved delivery					
RFID has improved the speed and convenience of reading tags with greater precision in the firm hence saves time related to delivery of products					
RFID has led to reduction in labour costs associated to delivery and improved efficiency in the firm					
RFID has improved the security and privacy of the store, hence supplies and customers feel safer working with the store					

SECTION C: CHALLENGES FACING THE ONLINE SUPPLY DELIVERY

Please indicate the extent to which you agree with the following statements in the scale of 5=Strongly Disagree, 4=Disagree, 3=Neutral, 2=Agree, 1=Strongly Agree.

Challenges	**1**	**2**	**3**	**4**	**5**
In your organization, the customer ordering products are unresponsive upon delivery of the orders					
The customers change preferences and return goods upon delivery					
In your organization, there is an increase in customer dissatisfaction of the services offered					
Customers complain about the period of time taken to deliver the ordered goods					
There is lack of adequate carriers to deliver ordered goods to clients					

It is expensive to outsource different suppliers for goods and services to be sold online					
It is expensive to outsource the transport services to facilitate the transportation of orders supplies to clients					
The customers complain of using your online applications					

SECTION D: SUPPLY DELIVERY

Please indicate the extent to which you agree with the following statements in the scale of 5=Strongly Disagree, 4=Disagree, 3=Neutral, 2=Agree, 1=Strongly Agree.

Online Supply Delivery	**1**	**2**	**3**	**4**	**5**
Goods are delivered on time in the store					
Goods are delivered in full in the store					
The goods ordered are the goods received/delivered from/to suppliers/customers					
Goods are delivered in the desired quality in the store					
There are no lead-time variance metrics in the store					

THANK YOU.

Appendix III : List of online supply stores

1. Kilimall
2. Jumia Kenya
3. Olx Kenya
4. Pigiame
5. Cheki.co.ke
6. Kenya Car Bazaar,
7. Buy Rent Kenya
8. Mimi Online Store
9. BuyUSA-Kenya
10. Electro Hub
11. Mama Mikes
12. Dakika Online
13. Rupu
14. Citimarket
15. Bidor Buy Kenya
16. VituMob.com
17. Vituzote.com
18. Mall for Africa

Source: Biz Kenya (2017). (www.bizkenya.com) Accessed on 20th June, 2017