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Effects of Electronic Logistics on the Logistical Performance of Logistics Firms in Kenya: A Case Study of Maersk Kenya Limited

Agnes Kasyoka Kithiia

Student, Jomo Kenyatta University of Agriculture and Technology, Kenya

Abstract:

Changes in management of supply chain happen with development of clients' needs and technological possibilities of cooperating partners. The integration of IT with logistics management is becoming a prerequisite for good logistic management hence the development of e-logistics. Although e-logistics is increasing in importance, there are indications that firms in developing countries may not reap the full potential benefits of this technology. The purpose of this study was to determine the effects e-logistics has on logistics performance in order to encourage taking up this technology. The use of e-logistics has been supported by the Network theory, Transactional cost theory and Resource based theory among other theories. Empirical literature on e-logistics revealed several benefits to the supply chain such as decreased costs, increased visibility and improved overall responsiveness of the supply chain. The independent variables that affected logistics performance for this study included e-logistics cost related management, e-logistics responsiveness, e-logistics data management and e-logistics flexibility. The study employed stratified random sampling and purposive random sampling procedures to select a sample of 75 individuals from a population of 107 employees. Primary data was collected using a predesigned and tested questionnaire that was self-administered by the respondents. After the fieldwork, the data was coded and tabulated by use of tables. Data analysis was done using Statistical Package for Social Sciences computer software (SPSS version 20.0) for windows. The results of the study revealed that e-logistics has a positive influence on the performance of the organisation and logistic firms are therefore encouraged to invest and adopt it in order to be more competitive in the market. It is therefore recommended that the study is replicated in other logistic sectors such clearing and forwarding, warehousing, manufacturing companies in order to establish whether e-logistics will have the effect on logistical performance.

1. Introduction

1.1. Background

This chapter gives background knowledge and some key concepts related to this study.

1.1.1. Logistics

Logistics is part of the supply chain process that plans, implements and controls the efficient, effective flow and storage of goods and services and related information from the point of origin to the point of consumption in order to meet the customer's requirements (Ayer, 2001).

According to Coyle (2003), a supply chain is recognized as an important aspect of an organisation that can make an organisation more globally competitive. Supply chain management (SCM) is a network of the logistic systems and related activities of all the individual companies that are part of a particular supply chain.

Based on the modified definition from the council of logistics management, logistics is part of supply chain management (SCM). It involves getting the right product to the correct place at the time and condition required by the customer (Peter and Attwood, 1992). Tilanus (1997) proposes that logistics entails inbound logistics, material management and physical distribution. It describes the entire process of materials and products moving into, through and out of the firm. Inbound logistics covers the movement of material received from suppliers. Materials management describes the movement of materials and components within a firm. Physical distribution refers to the movement of goods outward the end of the assembly line to the customer.

Various empirical studies, such as Ellinger, Daugherty, and Keller (2000), show that logistics is a strategic vector in companies' organization and influences their performance, namely in terms of service quality and overall profitability. In parallel with its internal importance, logistics also has an impact on effectiveness and profitability, as mentioned by Mentzer and Lisa (2001). Logistic practices have a positive impact on business performance, namely in speed of delivery, the responsiveness and flexibility of delivery, and also influence marketing performance, which has a leverage effect on the average sales growth and business profitability (Green,

McGaughey & Casey, 2006)). Li, Ragu-Nathan and Subba (2006) perceive that the management of logistics activities has become a valuable way of securing competitive advantage and improving organizational performance.

1.1.2. History of Logistics

The term, logistics, was initially developed in the context of military activities in the late 18th and early 19th centuries and it launched from the military logistics of World War II. The probable origin of the term is the Greek *logistikos*, meaning 'skilled in calculating' (BTRE, 2001). Logistics was initially a military activity concerned with getting soldiers and munitions to the battlefield in time for flight, but it is now seen as an integral part of the modern production process. The main background of its development is that the recession of America in the 1950s caused the industries to place importance on goods circulations. Before the 1950s, logistics was under the dormant condition. Production was the main part of the managers concerned, and industry logistics was once regarded as "necessary evil" in this period.

During the 1950s to and 1960s, applying new ideas of administration on business was a tendency. Drucker (2001), who thought *Logistics was The Economy's Dark Continent*, regarded the procedure of physical distribution after producing products as the most possible development area in American businesses but also the most neglected area. Lewis's study (cited in Chang, 1998) in 1956 on the role of air transportation in physical distribution was the application of "total cost concept" and it pointed out the notions of trade-off between inventory and transportation. From the 1970s onwards, more and more applications and researches of logistics appeared. Due to petroleum price rise in 1973, the effects of logistics activities on enterprises grew.

Slow growth of market, pressure of high stagflation, release of transportation control, and competitions of the third world on products and materials all increased the significance of logistics system on planning and business at that time (Ballou, 2006). The further tendency of logistics in the early 21st century is logistics alliance, Third Party Logistics (TPL) and globalised logistics. The distance between suppliers, manufacturers, distributors, customers and consumers continues to shrink because e-commerce is having an enormous impact on the logistic function in most companies (Ross, 2003). With the advancement of globalization, logistics plays a major role in linking the source, intermediaries, producers, buyers and the end users. Bayles (2001) reports that the customers today want to be able to track their orders, reroute package, and determine delivery costs and transit time.

Some of the current trends in logistics include the use of E-commerce. E-commerce is the future trend of business style. It brings many benefits for both companies and consumers like expanding the market area, promoting the company's efficiency and competitiveness. The digital revolution has driven the development of e-business. Early applications can be traced back to the 1960s, but e-business only became popular in the 1990s due to the widespread use of the internet. Bayles (2001) further proposes that the internet has offered companies the opportunity to establish e-commerce with customers directly or other businesses that may later form part of their supply chain.

1.1.3. E-Logistics

E-logistics entails the use of systems, informatics tools and the Internet as communication medium to service logistic processes. Another possible definition can be that e-logistics simply means processes necessary to transfer the goods sold over the internet to customers according to Auramo (2001). Calza and Passaro (1997) emphasize that the integration of IT with logistics management is an important prerequisite for good logistics management. The most often used tools of cooperation in the virtual scope of e-logistics are: The Internet portal, electronic platform, electronic catalogue, data warehouses, information services of offers and purchasing, transactions systems, systems and communication tools, systems and software, e.g. applications of supply chains' planning, dictionaries, digital maps and e-learning systems.

Mandatory technologies introduced in Kenya like the Single Window System (SWS) and Electronic Cargo Tracking Systems (ECTS) are helping firms to cut transportation costs and increase speed of cross-border transactions. The SWS which allows submission, receipting and processing of cargo documents electronically at a single entry point was introduced by the Kenya Trade Networks Agency to speed up import and export trade. It was launched in May last year by the three East African Presidents. The Kenya Revenue Authority (KRA) had on the other hand introduced the ECTS in 2013 to track transiting cargo, getting minute by minute reports. Top logistics companies in Kenya like Siginon Global logistics and Bolloré Africa logistics have already embraced varied technologies to manage their service. Siginon is for instance using the Vehicle Display Output (VDO) system which tracks cargo and trucks plying long distance routes, giving real-time updates on their location.

Technology offers tremendous promise in transforming the processes related to ocean freight shipping services. Rust (1999), for example, envisions a general transformation in services as the inevitable result of dramatic advances in technologies in computers and communication. Technology can provide faster response to customer needs which is a requirement for survival in the competitive container shipping sector. Laine and Vesalainen (1994) provide evidence that technology can add tremendous value in harnessing the profit-making potential in port operation. Advanced cargo handling technologies, for example, can reap significant cost savings for shippers and shipping companies alike. Verma (1997) argues that Shipping companies have used internet technology as a marketing tool to attract customers.

1.1.4. Maersk Kenya Limited

The Maersk Group is a worldwide conglomerate and operates in some 130 countries with a workforce of over 89,000 employees. In addition to owning one of the world's largest shipping companies, Maersk is involved in a wide range of activities in the shipping, logistics, and the oil and gas industries. Maersk Kenya Limited was established in 1994 following an upgrade of the East African Service. It trades as Maersk Line and Safmarine. Maersk line and Safmarine provide containerized sea freight from various ports of the

world like the Americas, Europe, Middle and far-east and Australia. It has branches in Nairobi and Mombasa. maritime customers care about service quality more than the delivery price. Thus, it is necessary to build new logistics concepts in order to increase service satisfaction, e.g. real-time information, accurate time windows and goods tracking systems. It is for this reason that Maersk line provides its customers with advanced e-commerce capabilities. Maersk line has an online website where customers can make bookings online, track their shipments and get their invoices for payment. Customers are also able to get online delivery orders for their import shipments. It also incorporates EDI (Electronic data interchange) which is a non-paper technique of exchange of formalized data between informatics systems. It also has an intranet system to provide information and service to meet the needs of the employees. This typically includes interactive tools for facilities for technical documentation, human resources, sales and marketing and financial matters.

1.2. Statement of the Problem

E-logistics has become a “hot” topic for a number of different reasons. These include the trend towards multi-site operations with several independent parts involved in the production and delivery processes. Internationalization of trade and information flows, market liberalization and new technological opportunities are urging many transportation and logistics companies to take action (Andersen, 2000). Customer’s requirements expressed whether in terms of reliability, transparency, flow, payments, and international connectivity have put some tremendous pressure on logistics companies. In this context, the race to most sophisticated information technology (IT) applications appears to lots of companies to be the key to success. Irrespective of the fact that Logistic firms are making much profit, they still suffer from inefficiencies and insecurity. Critically evaluating the introduction of e-logistics owing to its objectives, it is not concern with how much technology is provided but how well it serves potential users.

Although e-logistics is increasing in importance worldwide, particularly in the industrialised countries, there are indications that firms in developing countries may not reap the potential benefits of this innovation because of low levels of technological development and the relatively high cost of implementation (including network infrastructure and software, training, production process, and reorganisation). Little empirical studies, such as that by Al-Somali, Gholami, and Clegg (2011), have been conducted to examine the experiences of e-commerce adoption in developing countries. The sparse literature that does attempt to explain the difficulties faced by firms in developing countries when they try to implement e-commerce suggests that a combination of factors constrain firms from taking full advantage of the new electronic means of trading (UNCTAD, 2004). Alam, Khatibi and Ismail (2007) and Cullen & Webster (2007) also report that researchers found tremendous growth in e-commerce globally as reflected in the enormous volume of goods and services traded between firms and especially so in the B2B arrangement. However, the African case was not very impressive despite the enormous potential and growing awareness of e-commerce as not much has taken place in developing countries including Kenya.

Studies done on e-commerce in Africa indicate that countries in Africa are at different stages of e-commerce development with South Africa in the lead, while for some countries e-commerce is completely non-existent (Ellegaard, 2006). According to the Global competitive report (2014-2015) published by the World Economic forum, Kenya was ranked 90 out of 144 countries on the global competitiveness index. It was also ranked 87 out of 144 for technological readiness. The technological readiness pillar measures the agility with which an economy adopts existing technologies to enhance the productivity of its industries, with specific emphasis on its capacity to fully leverage information and communication technologies (ICTs) in daily activities and production processes for increased efficiency and enabling innovation for competitiveness. The East Africa Logistics Performance Survey (2014) ranked Kenya’s logistics sector as one of the two most inefficient in the region. The country performed poorly on timely delivery of shipments, the competence and quality of logistics services, the percentage of shipments physically inspected, the transparency in conducting customs valuations and on conflict management in trade disputes. Given the cited low uptake status, developing countries, and indeed Kenya, have not been able to reap the full benefits derivable from investment in information technology in logistics.

Christopher (1992) affirms that information has always been central to the efficient management of logistics but now enabled by technology, it is providing the driving force for competitive logistics strategy. The logistic firm’s management needs to keep up with the continuous technological changes taking place around the world as this has the potentiality of affecting their performance in terms of security, clearance and service delivery. The purpose of this study was therefore to understand the effect e-logistics has on the performance of the logistics function since the role of the logistician is to optimise the supply chain to its fullest potential. It is for this reason that e-logistics practices are becoming the subject of studies as companies need to cope with increased competition more efficiently and effectively to ensure profitability and growth (Bayles, 2001).

1.3. Objectives

1.3.1. General Objective

The general purpose of this study was to evaluate the effects of e-logistics on the logistical performance of logistic firms in Kenya.

1.3.2. Specific Objectives

The specific objectives of the study were as follows:

- i. To analyse the effect of e-logistics cost-related management on the logistical performance of logistic firms.
- ii. To establish the effect of e-logistics responsiveness on the logistical performance of logistic firms
- iii. To investigate the effect of e-logistics data management on the logistical performance of logistic firm.
- iv. To examine the effect of e-logistics flexibility on the logistical performance of logistic firm.

1.4. Research Questions

To achieve the outlined objectives, the study was guided by the following questions:

- i. How does e-logistics cost-related management affect the logistical performance of a logistics firm?
- ii. What is the effect of e-logistics responsiveness on the logistical performance of a logistics firm?
- iii. How does e-logistics data management affect the logistical performance of a logistics firm?
- iv. What is the effect of e-logistics flexibility on the logistical performance of a logistics firm?

1.5. Justification for this Study

Al-Qirim (2007) indicates that firms are actively looking for suitable solutions and methods of adopting e-commerce into their business processes. Although there is a growing body of literature dedicated to the analysis of the technical and operational aspects of e-logistics, little empirical research exists on topics relating to the effects of e-logistics on the performance of the logistics function. Similarly, little empirical research has been conducted to examine the success of e-logistics in the Kenyan economic industry. The study was further premised on the fact that despite the huge potential benefits of e-logistics, there is evidence of slow uptake. Results of this study will provide an incentive for stakeholders to develop appropriate interventions with the potential to enhance the uptake of e-logistics in order to remain competitive in the market. The study will give the managers more insights on the effect of e-logistics on logistics performance hence they would be in a position to make strategic decisions concerning the use of IT within their organization.

1.6. Limitations of this Study

It is recognised that this study has some limitations.

- i. The study made cross-cultural references to studies undertaken internationally. Such reference may not have been entirely appropriate, but was inevitable due to the dearth of previous studies of e-logistics and its implications on the performance of logistics specifically in Kenya. Differences in the results of this study and those obtained elsewhere were explained partly by the cross-cultural differences in socio-economic settings.
- ii. Retrieving records from when e-logistics was not implemented was difficult for comparative analysis and therefore sought the assistance of IT experts to access archived records.
- iii. The respondents were too busy for interviews and this was resolved with advance planning and scheduling in order to ensure time was set aside for the interview sessions.

2. Literature Review

2.1. Introduction

In this chapter, both the theoretical and empirical literature were reviewed. The first section reviewed the relevant theories and exposed the theoretical foundation underlying the effects of e-logistics on the performance of the logistics function. The second section covered the empirical literature, while the third section presented the conceptual framework. The final section covered an overview of the literature and research gap.

2.2. Theoretical Framework

The literature suggested that the use of e-logistics was based on one of the following theories among others: Network theory, Transaction cost theory and Resource based theory.

2.2.1. Network Theory

Oliver (1990) argues that the network theory can be used to provide a basis for the conceptual analysis of reciprocity in co-operative relationships between supply chain partners. In this case the firm's continuous interaction with other players becomes an important factor in the development of new resources (Haakansson & Ford, 2002). The network theory (NT) contributes profoundly to an understanding of the dynamics of inter-organizational relations by emphasizing the importance of "personal chemistry" between the parties, the build-up of trust through positive long-term cooperative relations and the mutual adaptation of routines and systems through exchange processes. A supply chain consists of all parties involved, directly or indirectly, in fulfilling a customer request and this includes the manufacturer, transporters, retailers, and customers themselves.

As proposed by Chopra and Lovejoy (2004), an integrated supply chain network is a group of independent companies forming a strategic alliance with a common goal. Through direct communication, the relationships convey a sense of uniqueness, ultimately resulting in supply chains as customization to meet individual customer requirements. The parties gradually build up mutual trust through the social exchange processes.

According to Monczka, Handfield and Giunipero (2009), a well-designed network provides streamlined material flow between all partners cutting down the lead time and cost of moving materials. A secure and reliable communications network linking all the supply chain partners provides the information integration and therefore e-logistics plays an important role in co-ordinating the activities within the supply chain network. E-logistics offers easy and convenient access to business partners across the world as it enables sharing of information and visibility through the supply chain.

This theory supports e-logistics responsiveness since this can be developed with a suitable network of collaborative firms. E-logistics Information technologies such as Electronic Data Interchange (EDI), the Internet, World Wide Web have contributed greatly to

improving communication with partners in the logistics and enhances collaboration between the parties in the supply chain. One such example of such collaboration may involve transmitting the location of transportation vehicles using global positioning systems (GPS), using Internet-based systems to transmit material requirements to suppliers, or using bar code technology to monitor the timeliness of receipts from suppliers. RFID tags are being used in more applications to capture real-time data about material and product movement across the supply chain.

2.2.2. Transaction Cost Theory

Transaction cost theory (TCT) gives an explanation of the nature of transactions and the possible savings companies can achieve through strategic use of e-business and more specifically e-logistics in logistics management. TCT has its origin with Coase's classical paper "The nature of the firm" published in 1937, and is basically a way to explain the costs of doing activities internally versus the cost related to buying the same goods or services in the market. Coase (op. cit.) stated that there would be no collaboration in a market with very low transaction costs. Likewise, there would be no collaboration in markets with extremely high transaction costs. In such markets, the only reasonable actions would be in house production (Williamson, 1998). Making exchanges generate costs and this is the core of TCT and is what distinguishes it from neoclassical economic theory. The overarching goal is to maximize performance by minimizing transaction costs within and between organizations. TCT seeks to explain the organizing of production and trade by exploring the effects of these costs. While there exists a cost of making exchanges there is also generated costs regarded to organizing the internal production. This administration cost seems to increase with the size of the firm. This phenomenon is called diseconomies of scale.

Williamson (1998) further argues that Transaction costs economics employs two basic assumptions about behaviour: bounded rationality and opportunism. Further, the basic dimension of transitions relies on three factors: the frequency they occur with, the degree and type of the uncertainty they are associated and finally the conditions of asset specificity. This is where Business process engineering comes in which involves reducing the cost by internally organizing the structure of the firm (Hammer and Champy, 1993). As global competition has increased, firms have moved from a process centric view of the world to a more a customer centric one.

The use of the Internet and other information technologies facilitate the use of analysing and deploying customer data to increase customer satisfaction. This model gives emphasis to e-logistics cost related management. With the advent of ECRM which is a subset of e-logistics, interaction with customers is made faster and with less operation cost because system implementation and expansion can be managed in one location and server as proposed by Elkhateb (2012).

2.2.3. Resource Based Theory

The resource-based view (RBV) emphasizes the firm's resources as the fundamental determinants of competitive advantage and performance. It adopts two assumptions in analysing sources of competitive advantage. First, this model assumes that firms within an industry may be heterogeneous with respect to the bundle of resources that they control. Second, it assumes that resource heterogeneity may persist over time because the resources used to implement firms' strategies are not perfectly mobile across firm as discovered by Peteraf and Barney (2003). The resource based view of the firm has its roots in a reaction to Porters (1998) work where it is suggested that a company's strategy is centred on market power and environmental models where either greater benefits are enhanced with the same costs (in comparison to rivals) or the same benefits as rivals are produced to lower costs (Barney and Clark, 2007).

A capability is considered as *valuable* when it improves a company's efficiency and/or effectiveness (Barney and Clark, 2007). In order to be a source for competitive advantage, the capability must also be *rare*, i.e. not possessed by many other competitors. It must be valuable and provides a company with a "first mover advantage" vis-à-vis competitors. It must also be imperfectly imitable, i.e. too difficult or too costly for other companies to obtain. Today there are several empirical examples of companies such as Wal-Mart, Dell and Hewlett Packard where logistics has a clear role in the strategy of the firm and is a driver for corporate level profitability and growth (Abrahamsson, Aldin and Stahre, 2003). These companies have in common superior logistics systems that are utilised as a strategic weapon against competitors. In line with the increasing evidence and number of empirical examples, the strategic role of logistics has also been recognised among logistics scholars in recent years (Autry, Zacharia, and Lamb, 2008; O'Marah and Hofman, 2009), and the link between logistics performance and strategic management has been emphasised (Cheng and Grimm, (2006); Ketchen and Giunipero, (2004). Thus, logistic capability can be regarded as a key strategic resource for competitive advantage as perceived by Olavarrieta and Ellinger (1997).

Logistics capability can be developed by integrating information technology in the logistics processes. E-logistics can improve distribution performance, facilitate logistics integration, and contribute to supply chain success (Dubois and Gadde, 1997, Williams, Nibbs, Irby, and Finley, 1997; Chopra and Meindl, 2001). This concept highlights the value of e-logistics data management and e-logistics flexibility as they could be unique capabilities of a firm. E-logistics capability is viewed as a catalyst to avoid supply chain management failure. Burgess (1998) and Closs, Goldsby, and Clinton (1997) affirm that e-logistics can improve services and reduce costs simultaneously, and significantly influences overall logistics competency: thus leading edge firms strongly invest in state-of-the-art IT.

2.3. Empirical Literature

Various studies have been carried out on supply chain management. A study conducted on progressive companies in Finland by Auramo, Aminoff and Punakivi (2005) revealed several benefits of information technology on supply chain management. A survey of 48 progressive companies was conducted to identify what IT solutions they have implemented in SCM followed by 18 in-depth case

studies to identify the mechanisms for achieving benefits of IT in SCM. Some of the findings included improved customer service elements, improved efficiency and information quality and supported better collaboration with the supply chain partners. The focus of the paper was on single companies and not on the entire supply network. However, the findings of this study present an opportunity to further develop understanding of the underlying mechanisms of how IT investments benefits supply chain management.

As already stated earlier, in a global economy and in competitive and dynamic environment, logistics is an important strategic factor for increasing competitiveness. Logistics management is the part of the SC involved with the forward and reverse flow of goods, services, cash, and information. Handfield, Straube, Pfohl and Wieland (2013) conducted a study on the trends and strategies in logistics and supply chain management. The results point to the fact that leading companies are embracing the complexity associated with their growing logistics boundaries, and is deploying strategies designed to monitor, respond, and manage this complexity. These insights were derived by a survey using responses from 1757 individuals from supply chain executives (including logistics service providers (LSPs), retailers, and manufacturing companies). One of the trends discovered was the use of technology which must be leveraged to provide insights, visibility, and promote an action oriented culture. Respondents expect 30% growth in new technology investments in RFID, inventory optimization software, as well as in analytics and big data technologies. Technology investments that have a direct tie to user requirements, customer responsiveness, and accountability for results have the best promise of being adopted successfully.

The advent of information technology (IT) revolutionizes logistic operations. Poor logistics performance reflects the firm's information capability which indirectly impacts financial performance (Shang and Marlow, 2005). A study by Tilokavichai and Sophatsathit (2011) analyses the linkage between the logistics information system and logistics performance under conditions on uncertainty. The survey was conducted on distribution activity and applied Technology Acceptance Model to extrapolate the intention to use LIS. A case study was taken from a large household product firm whose business survival depended on logistics performance. Various logistics activities were analysed to determine the associativity among these activities. As such, related linkages were established for subsequent logistics performance monitor and improvement. It was discovered that many firms applied information technology such as enterprise resource planning (ERP) and information systems (IS) in operational process management to cost effectively serve the customer's requirements. The results show that the perceived support of LIS usage such as requirement responsiveness and correct information has positive impact on logistics performance management.

Several researches have been done on e-logistics. An example is the strategic implications of e-logistics by Bolseth and Solem (2005). The purpose of the paper was to develop an understanding of the impact of the e-business and Internet on the logistics and supply chain - the benefits as well as the risks - including impact on supply chain strategy, design, organization design and infrastructure. The subject of the study was Glamox, a Norwegian industry group. Some of the conclusions on study as the effect of e-logistics included reduced number of suppliers with concentrated relationships, reduced inventory, reduced number of competitors and increased number of bonds in the supply chain based on ICT. Further noted on logistics as a competitive edge, is that logistics processes will be performed in a new or more automated way and with a high potential for profitability increase.

A study on the effects of e-logistics on customer satisfaction by Elkhateb (2012) reveals that businesses can use the internet to gain global visibility across their extended network of trading partners and help them to respond quickly to a range of variables, from customer demand to resource shortages. E-logistics also provides buyer benefits such as being able to purchase both direct and indirect materials at a lower cost and being able to forge strong ties with suppliers and collaborating with them more closely in product design and development.

Barcik and Jakubiec (2012) indicates the various tools of e-logistics such as electronic data interchange, database and radio frequency identification(RFID) in a research on the aspects of functioning for e-logistics.

As advocated by Wang and Chen (2006), e-logistics can improve the overall responsiveness of supply chains and create a new source of advantage to ensure competitiveness in enterprises in China. Zhou and Matin (2008) study on the applications of e-logistics on SMES in China suggests that China needs to invest more in infrastructure like roads and information technology in order to keep with China's growing economy. Angheluta and Costea (2010) investigated how multinational organizational utilize of e-logistics in Multinational companies, a case study of Volvo logistic corporation and Hair Corporation. Two research questions were stated as follows; focusing the factors that influence the e-Logistics system and how e-logistics will change the multinational traditional logistics systems and key Performance Indicators for these changes.

2.4. Conceptual Framework

A conceptual framework is a visual or written product, one that, "explains either graphically or in narrative form, the main things to be studied, concepts, or variables and the presumed relationship among them (Lee & Wang, 2001). This study was guided by the variables as conceptualized overleaf by the researcher. It consists of the dependent variable and independent variable.

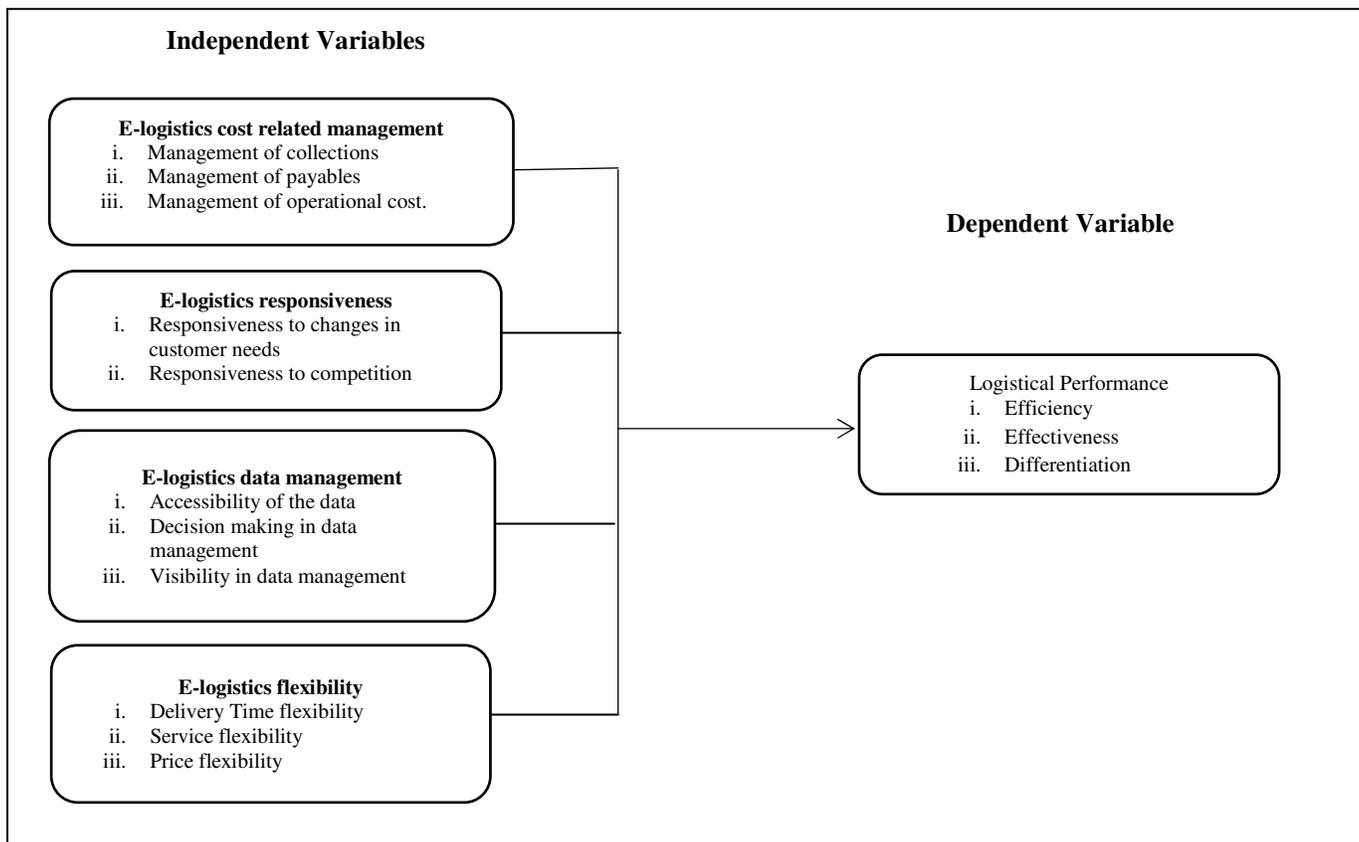


Figure 1: Conceptual Framework

2.4.1. Logistical Performance

The importance of analysing logistic performance was first shown in the work of Bowersox and Closs (1996), who reported that measurement of logistics performance consisted of a methodology for analysing resources of the logistic function, and its main objectives were monitoring and control of the logistics operations. As Robb, Xie, and Arthanari (2008) mention, since logistics deal with physical, informational and cash flow management, it is generally recognized as a major determinant of business performance, but practices particularly in terms of performance analysis, are still at the stage of being studied by professionals and academics.

Researchers have analysed logistic performance in different ways. Fugate, Mentzer and Stank (2010) analyses logistics performance based on evaluation of a set of dimensions of the activities carried out by the logistic functions, which are namely, efficiency, effectiveness and differentiation. According to this analysis, efficiency is a dimension related to the use of resources allocated to the logistic function, effectiveness can be defined as the extent to which objectives are achieved and differentiation is understood as the value that can be generated by the elements of customer service in relation to competitors. Aramyan, Alfons, Oude, Vorst and Kooten (2007) theorized a conceptual framework for evaluation of logistics performance, which suggests dividing the analysis of logistics chain performance in four categories or clusters of indicators which include responsiveness, flexibility, efficiency and quality.

According to Töyli, Häkkinen, Ojala, and Naula (2008), logistic performance includes three components: (1) the service level that aims to characterize the service quality for logistics clients, the level of perfect orders and the duration of the cycle; (2) operational metrics that characterize the logistics performance based on time, including stock rotation and average payment and receipt; (3) the level of logistics costs that characterize the efficiency of logistics operations. These elements are similar to those of Fugate, etal (2010) and will form the basis for this study. Logistic performance may be seen as part of the larger notion of organisational performance (Bowersox, Patricia, Daugherty, Duroge&Richard,1992). SCM has evolved through the application of e-logistics into a powerful strategic function capable of engendering radically new customer value propositions through architecting of external, internet enabled collaborative channel partnerships (Ross,2003).Green, McGaughey and Casey (2006), addressing the relationship between logistics practices and organizational performance in a large number of companies in the United States, concluded that logistic practices have a positive impact on business performance, namely in speed of delivery, the responsiveness and flexibility of delivery, and also influence marketing performance, which has a leverage effect on the average sales growth and business profitability.

2.4.2. E-Logistics Cost Related Management

Since logistics costs can account for such a large proportion of total costs in the business, it is critical that they be carefully managed. Logistics management impacts not only upon the profit and loss account of the business, but also upon the balance sheet. Logistics is also increasingly being recognized as having a significant impact upon economic value added and hence shareholder value. It is critical that decisions on logistics strategies made based upon a thorough understanding of the impact they will have on the financial

performance of the business. According to Ramakrishma (2008), on an average, half the sales income in an organization is spent on logistic operation. An e-payment approach to collections avoids these excess costs and delivers added benefits to the organization: It improves transparency, ensures compliance and aggregates financial data, while lessening the administrative burden of accepting paper checks. It increases efficiency and improves security. In other words, organizations earn or lose large sums depending on how effective their logistic cost Management is (Ramakrishma, 2005).

Logistics costs have an important influence on pricing a product. This was shown in a survey where 200 European companies participated. The results were that logistics costs are between 7.7% and 22% of the final price of products (Požar, 2002a). Prahalad and Hamel (1990) asserted that Internet technologies offered businesses significant benefits such as decreases in inventory and intermediary related costs, increases in supply chain efficiency, simplicity and transparency in order placement, delivery, procurement, and management of suppliers and customers, and an ability to stay focused on their core competencies. The potential for operating cost reduction through logistics and supply chain management is considerable. Because a large proportion of costs in a typical business are driven by logistics decisions and the quality of supply chain relationships, it is not surprising that in the search for enhanced margins many companies are taking a new look at the way they manage the supply chain through e-logistics. It is not just the transportation, storage, handling and order processing costs within the business that need to be considered. Rather a total pipeline view of costs on a true 'end-to-end' basis should be taken.

According to Benjamin and Wigand (1995), physical distribution costs will partially be reduced through the elimination of intermediaries if companies choose not to outsource their logistics activities. A study by Bolseth and Solem (2005) revealed that the e-logistics has the effect of leading to simplified and reduced inventories and transaction costs between sellers and buyers and significantly reduce the operational costs. The case study was Glamox, Norwegian industry group which went from being a 'brick and mortar' company to a 'click and mortar company'.

2.4.3. E-logistics Responsiveness

A study by Sarkis, Talluri and Gunasekaran (2007) defines a responsive supply chain as, "A network of firms that is capable of creating wealth to its stakeholders in a competitive environment by reacting quickly and cost effectively to changing market requirements." There is a need to meet the changing market requirements by developing a suitable network of collaborative firms based on the core-competencies and on leveraging people and information as quickly as possible and in the most cost-effective manner. The study further mentions that there are three major enablers of RSC, namely, value chain or a collaborative network of partners, Information Technology (IT) and systems, and knowledge management. Since the advent of internet technology, the computing environment in many applications has been changed drastically. The increased information requirements have facilitated an integration of logistics information systems (LIS) and supply chain information systems in many companies.

The increasing use of electronic commerce and enterprise resource planning and other logistics information systems tools and techniques will shape the business process for the foreseeable future (Stephen, Rutner & Gibson, 2003). The application of the Internet in a supply chain will result in a reduction in response times to customer requirements through the use of a shared information platform such as WWW and e-mail and such technologies as EDI and RFID to improve the communication among partners along the supply chain to make it easier to trace materials flows. Companies are adopting e-business to develop deep, personalized relationships with their customers (often consumers). Nearly 50% of Dell's \$32 billion in annual revenues are now transacted over the web and other manufacturers and distributors are also reporting sharp increases in on-line sales.

According to Dyché (2001), E-CRM is a combination of software, hardware, application and management commitment and is therefore a sub-set of e-logistics. Critical and significant point is that E-CRM takes into different forms depends on the objectives of the organizations. Dyché (2001) has defined two types like Analytical E-CRM and Operational E-CRM. Analytical CRM is a collection of customer's data as continuous process. The main purpose of this means is to identify and understand customer's needs and to create new business opportunities by giving prior importance to the customers. Operational E-CRM means the diverse ways of resembling the customer by web based emails, phone, fax etc. Dyché (2002) has also identified the main aim of E-CRM systems is to improve and provide better customer service, develop a relationship and preserve valuable customers.

Technology can provide faster response to customer needs which is a requirement for survival in the competitive container shipping sector. Laine and Vesalainen (1994) provide evidence that technology can add tremendous value in harnessing the profit-making potential in port operation. Technology facilitates better interactions among customers and service personnel, makes call centres more efficient, helps sales staff close deals faster, discovers new customers, simplifies marketing and sales processes and creates a competitive advantage in the market. CRM, in turn, provides an integrated approach in managing important aspects of customer relationships and in adding value to the many dimensions involved in customer relationships as affirmed by Deck (2001). Global positioning systems and cargo tracking technology are also making it possible to determine the precise location of customers and shipments.

2.4.4. E-logistics Data Management

Logistics data management entails the collection, review, aggregation, analysis, and interpretation of logistics data and the development and dissemination of logistics data reports. As mentioned in USAID (2010), the purpose of collecting logistics data is to improve customer service (i.e., commodity availability) by improving the quality of management decisions. One of the fundamental tools of supporting business processes have become electronic data interchange through the Internet. It has caused an independent access to information about products' flow and localization of supply chain's partners. The electronic data interchange between

partners let them cooperate in real time and create an integrated supply chain which allows accessibility to information. Efficient, reliable and effective functioning of supply chains requires beyond good management of a system of information flow (Moron, 2006).

To make the collected data useful for decision making, it must be aggregated and analysed, and then shared with the appropriate decision makers. Data-driven decision making exists at the intersection of data quality and decision quality, where quality data supports quality business decisions. The best way to maximize the efficiency and effectiveness of data-driven decision making is to focus on determining the sufficient amount and quality of data necessary for satisfying the execution of a business decision. As a result of globalization the amount of data arising in supply chains is raising, the competition is becoming fiercer and the customers often expect integrated services, what requires a close cooperation between involved organizations. The companies have to adapt to new business models and rethink their role and position in their value chain regarding the potential possibilities given by the utilization of big data to add value for their customers and suppliers (Robak, Franczyk& Robak,2012). Appropriate IT infrastructure is therefore needed to manage the 'big data'.

The first formal, academic definition of big data appears in a paper submitted in July 2000 by Francis Diebold of University of Pennsylvania in his work of econometrics and statistics:

"Big Data refers to the explosion in the quantity (and sometimes, quality) of available and potentially relevant data, largely the result of recent and unprecedented advancements in data recording and storage technology. In this new and exciting world, sample sizes are no longer fruitfully measured in "number of observations," but rather in, say, megabytes. Even data accruing at the rate of several gigabytes per day are not uncommon." According to Yan (2013), big data is a "hot" topic due to the potential value that it brings to us. With competition for resources becoming more intense than ever, organizations – both public and private sectors – have been searching for ways to differentiate themselves from their competitors by diving into the wealth of information to improve their competitiveness, efficiency, profitability and more.

Manyika (2011) projected in an industry report that five new kinds of value might come from big data: (1) creating transparency in organizational activities that can be used to increase efficiency; (2) enabling more thorough analyses of employee and system performance in ways that allow experiments and feedback; (3) segmenting populations in order to customize actions; (4) replacing/supporting human decision making with automated algorithms hence faster decision making; and (5) innovating new business models, products, and services.

Applications like ERP offered by firms such as SAP and ORACLE provide the basic functionality of visibility and tracking upon which tighter connectivity is executed within the supply chain by pulling information from a database and compiling an enterprise view. For example, through web interfaces, customers and suppliers can place orders to the firm or provide replenishment information for the firm (Christopher, 2004).

2.4.5. E-logistics Flexibility

Reichhart and Holweg (2007) define flexibility as the ability of any system to adapt to internal or external influences, thereby responding to achieve a desired outcome. Bernardes&Hanna (2009) define flexibility as enabling ability to change status while Grahal (2011) defines flexibility as a bilateral expectation of willingness to make adaptations as circumstances change. According to Swafford, Ghosh and Murthy (2006), flexibility can be defined as a competence built by an organization to be able to change or react with little penalty in time, cost or performance. Zhang, Vonderembse and Lim (2003) presented the comprehensive view of logistics flexibility from supply chain point-of-view. Swafford, Ghosh, and Murthy (2006) suggests that logistics flexibility can be viewed from competence and capability perspectives. Charles, Lauras and Wassenhove (2010) describes logistics flexibility in terms of procurement/sourcing flexibility, manufacturing flexibility and distribution flexibility and can create positive impact on supply chain agility.

Logistics flexibility has been mostly defined from manufacturing perspective. Swafford et al. (2006) defined manufacturing flexibility as the ability of manufacturing to adapt its capabilities to produce quality products in a time and cost effective manner in response to changing product characteristics, material supply, and demand, or to employ technological process enhancements. Physical distribution flexibility is the ability of a firm to adjust the inventory, packaging, warehousing and transportation of physical products to meet customer needs, quickly and effectively. Demand management flexibility is the ability of a firm to respond to the variety of customer needs for service, delivery time and price, quickly and effectively (Gligor and Holcomb, 2012). A fast response to changing demands is a critical driver of competitive advantage in today's markets. Customers expect their needs to be satisfied at the time of their expression. Companies therefore must have quick response times to changing needs, in order to gain or hold market-shares. Increasing business dynamics, changing customer preferences, and disruptive technological shifts have created a greater need for flexibility in the supply chain. Integrating flexibility into supply chains requires building efficient response mechanisms for adapting to changes in a host of internal and external factors.

In today's competitive and complex markets, logistic management has to function along a dynamic interplay of forecasting, risk management and decision making challenges (Wadhwa, Saxena&Chan, 2008). Cao and Zhang (2011) perceive that developing effective supply chain strategies will need to involve a complicated mixture of incentive alignment, information sharing, decision synchronization and collaborative planning and forecasting. Enhancing information visibility, improving communication among supply chain partners, and developing effective collaborative forecasting and decision support, e-logistics tools will prove immensely valuable to attaining the desired strategic goals (Wang and Wei, 2007). Damen (2001) introduces the Service Controlled Agile Logistics model for logistics control. The infrastructure for this model is not rigid and is changeable at any moment.

Integrated systems are now available which provide real time visibility of demand forecast information, inventory levels and production schedules. Supply chain systems must be capable of being adapted to meet changing demands quickly and cost-effectively. Individual software modules need to be as small as possible if maximum flexibility is to be achieved. This enhanced level of flexibility enables organizations to modify and enhance their supply chain systems as their business needs change (Krstev, Donev&Krstev, 2011).

2.5. Critique of Existing Literature

On the organizational level, as aggregate corporate performance, IT investment in supply chain management has been researched extensively. The results have become known as productivity paradox because the studies have not confirmed the expectations of a positive correlation between IT investment and Logistical firm performance (Evangelista, McKinnon and Sweeney, 2007). On the other hand, Closs and Kefen (2007) provide empirical evidences indicating that technology has the potential to improve overall logistics capabilities. There is increased use of IT in most organizations ranging from formal, government and informal sectors of economy. The available literature does not give enough evidence concerning the impact of e-logistics on the logistics performance rather most of them are dwelling on single business unit performance with most of them giving a general descriptive few of IT without in-depth analysis of their impact.

2.6. Summary of Literature

The theoretical framework justifies the use of e-logistics in organisations. The Network theory is basically a descriptive theory that examines how interacting companies in a supply network adapt their processes and systems to each other by exchange processes, and how they can develop trust and confidence in inter-organizational relationships over time. The network theory suggests that supply chain partners need to collaborate and e-logistics can be employed to facilitate faster communication and improve on the response time in the logistics chain. The transaction theory proposes that e-logistic technology can impact transaction cost by reducing operation costs The RBV complements TCA by considering the resources, capabilities, and competencies both inside the individual firm and in the linkages between the firms in a supply chain and looks at the activities should be outsourced and which should be kept in-house. The resource based theory implies that logistics capability can be developed by integrating information technology in logistics to gain competitive advantage in the market.

Various empirical studies have been done that implore the benefit if using information technology in supply chain management. A study by Auramo, et al (2005) reveals that the benefits of information technology on supply chain management that include improved customer service, efficiency and information quality. A research on trends and strategies in logistics and supply chain management by Handfield, et al(2013) points out that technology will be more incorporated in future to provide better visibility and improved customer responsiveness. Wang, et al (2003) advocates that e-logistics can improve the overall responsiveness of the supply chain and create a new source of advantage to ensure competitiveness in the market. The empirical literature also points out the benefits of using e-logistics like improving customer satisfaction, reducing transaction cost and forging stronger ties with supply chain partners.

Logistical performance has been defined by various researchers on different perspectives but all one conclusion that it is important to measure logistic performance as it affects the organisational performance. It can be analysed both in financial and non-financial ways. Some of the non-financial dimensions identified by various researchers include responsiveness, flexibility, efficiency, quality and differentiation. The elements of e-logistics that were used as the focus of this study to find out their effect on logistics performance included: cost- related management, responsiveness, data management and flexibility.

2.7. Literature Gap

Existing literature focuses on companies in developed countries such as China. Little research has been carried in Africa since the economic set up is different from that in countries in developed countries. Developing countries face a number of challenges when implementing e-commerce, notably economic and educational barriers, lack of ICT infrastructure, high telecommunications costs, and lack of payment mechanisms, security and trust issues, channel conflicts, and translation/localization problems. These issues are compounded when attempting to carry out e-logistics and e-fulfilment by the challenges of poor delivery logistics, complex global trade regulations, high tariffs, international terrorism and physical security concerns, and geographical obstacles (Bayles, 2001). This study focused on Maersk line East Africa which is company in a developing country. Past studies carried out on effects of information technology on supply chain management and logistics mostly point out to the benefits and challenges generally on the company's performance. There hasn't been a study that clearly measures the impact of e-logistics on the performance of the logistics function especially for a firm in a developing country.

3. Research Methodology

3.1. Introduction

This chapter discusses the research methodology used in the study. This chapter therefore presents discussions on the research design, target population, sampling techniques, data collection instruments and data presentation, analysis and interpretation as well as ethical issues. In this chapter, the research methodology used formed a basis for the type of data collection tools that were used. According to Rajasekar, Philominathan and Chinnathambi (2013), research methodology is a systematic way to solve a problem. It is a science of studying how research is to be carried out. Essentially, the procedures by which researchers go about their work of describing, explaining and predicting phenomena are called research methodology. Its aim is to give the work plan of research.

3.2. Research Design

Yin (2003) theorized that scientific research has three main investigation design purposes, namely, exploratory, descriptive, and explanatory. The study further contends that the goal of descriptive study is to develop a careful description of different patterns. Creswell and Plano (2011) indicate that exploratory studies enable researchers to determine and demonstrate the character of the research problem through collection of information by exploration. Explanatory studies are useful when the interest is in relations. Descriptive research design was used to carry out this research as it attempts to describe, explain and interpret conditions of the present i.e. "what is". It comprised of collecting data to determine whether, and to what extent, a relationship exists between or more quantifiable variables. The degree of relationship was expressed in terms of a coefficient of correlation. If the relationship existed between variables, it implied that scores on one variable are associated with or vary with the scores on another variable.

3.3. Population under Study

According to Mugenda & Mugenda (2009), a representative sample is one that is at least 10%-20% of the population. The study used a representative sample from each department to form the sample size which should at least be 50% of the total population of Maersk Kenya Limited.

3.4. Sampling Frame

A computerized database of the company staff obtained from the human resource office formed the sampling frame. This enabled the researcher to know the exact number employees in a department in order to randomly choose the sample.

Department	Population Size
Customer service	28
Sales	15
Finance	24
Trade and marketing	4
Operations	28
Human resources & Administration	8
Total population	107

Table 1: Sampling frame

3.5. Sampling Methodology and Sample Size

Stratified random sampling technique, defined by Sekaran (2003), as a process that involves stratification or segregation, followed by random selection of the subject from each stratum will be adopted for this study. This is because of the heterogeneity of the population and all respondents will have an equal opportunity of participation. The population was stratified into the various functions and the employees then selected randomly. The managers of each department were purposively selected to be part of the study because of their knowledge input. A majority of the respondents were being selected from the departments who were directly involved in administering e-logistics within the organization. i.e. customer service, sales, finance and human resource departments. It was also important to have the input of all the trade and marketing analysts as their analysis was very important for an organization that wanted to position itself competitively in the market.

Department	Population Size	Sample Size
Customer service	28	14
Sales	15	15
Finance	24	20
Trade and marketing	4	4
Operations	28	14
Human resources & Administration	8	8
Total population	107	75

Table 2: Sample Size

3.6. Pilot Testing

A pilot study can be defined as a 'small study to test research protocols, data collection instruments, sample recruitment strategies, and other research techniques in preparation for a larger study (Zailinawati, 2006). Its purpose is to determine the feasibility of the study. In this case, a small scale version of the complete survey is tested. The participants were given adequate time to consider whether they would like to participate. A pilot study was preferably done using subjects from a population that is different from those recruited for the main study. Experience gained by subjects in the pilot study would have been bias if the same respondents were used in the main study.

In order to test reliability of the instruments, internal consistence was applied using Cronbach's alpha. The value ranges between 0-1 with reliability increasing with increase in value. Co-efficient of 0.6-0.7 is commonly acceptable rule of thumb that indicated acceptable reliability and 0.8 or higher indicated good reliability (Mugenda & Mugenda, 2003). Validity is the strength of the conclusions, inferences or propositions. More formally, a correlation coefficient is a statistical summary of the relation between two variables. According to Cronbach, to the question "what is a good validity coefficient?" the only sensible answer is "the best you can get", and it is unusual for a validity coefficient to rise above 0.60, though that is far from perfect prediction. A population of 10 participants were selected for the pilot study.

Department	Pilot Study Sample
Customer service	2
Sales	2
Finance	2
Trade and marketing	1
Operations	2
Human resources& Administration	1
Total population	10

Table 3: Pilot Study Sample

3.7. Data Collection

Data was collected both quantitatively and qualitatively. Aliaga and Gunderson, (2000) describes quantitative research as 'Explaining phenomena by collecting numerical data that are analysed using mathematically based methods (in particular statistics)'. A definition offered by Nkwi, Nyamongo, and Ryan (2001) describes qualitative research involves any research that uses data that do not indicate ordinal values." It has attributes of both open-ended and inductive style of questioning and observation.

Data collection was primarily done through questionnaires. Questionnaires facilitate easy and quick derivation of information within a short time and with little administrative responsibility (Borg and gall, 1983). Both open and close ended questions were used. Permission was sought from the relevant authority to contact the study upon visiting the departments. Secondary data is data already recorded in order to come up with necessary information pertaining to the study. Secondary sources included the company's website, purchasing records, KRA websites and news relating to EDI and other relevant sources.

3.7.1. Data Collection Process

Prior to the commencement of data collection, the researcher obtained all the necessary documents, including an introduction letter from the University. Audience with the sampled local authorities in the company was sought to clarify the purpose of the study. Upon getting clearance, the researcher in person distributed the questionnaires to the sampled individuals who are the managers and other employees selected. Use of questionnaires was expected to ease the process of data collection, as all the selected respondents would reach in time. During the distribution of the instruments to the respondents, the purpose of the research was explained.

3.8. Data Analysis and Presentation of Findings

Kothari (2004) defines analysis as the computation of certain indices or measures along with searching for patterns of relations that exist among data groups. It is made up of qualitative statistics; analyzing information in a systematic manner in order to come to a useful conclusion and recommendation. The statistical method for this study was descriptive and inferential statistics. After the fieldwork, the data was coded and tabulated by use of tables. Data analysis will be done using Statistical Package for Social Sciences computer software (SPSS version 20.0) for windows.

Descriptive statistics such as mean and percentages were used to present the various characteristics for the data sets. For this kind of study, descriptive analysis was the best and has been supported by such scholars as Cooper and Schindler (2003). According to Kothari, (2003), correlation analysis studies the joint variations of two or more variables. Correlation of +1 means a strong relationship between the independent variables and the dependent variable. A positive coefficient ranges from 0 to 1.0. Tables and pie-charts were used to present the results of the study.

Pearson's Correlation formula

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}}$$

Where:

x=independent variable

y=dependent variable

r=correlation variable

4. Research Findings and Discussion

4.1. Introduction

This chapter represents results of this study based on the formulated objectives presented in chapter one. This chapter also contains the findings and discussions of the study and attempts to answer the research questions as derived from the research objectives. It begins by providing a general description of the respondents by giving details of their social economic characteristics. The next section provides the results for each objective.

4.2. Response Rate

The study targeted 75 respondents from Maersk Kenya limited, Mombasa, 73 questionnaires were filled. However, when the data was received, three questionnaires were found to have erroneous responses and were discarded leaving 70 properly filled questionnaires representing 90%. This response rate was acceptable and therefore was relied upon to derive conclusions from the study.

4.3. Bio Data

The study was done in Maersk Kenya limited, a worldwide conglomerate that operates in some various countries in Africa. In addition to owning one of the world's largest shipping companies, Maersk is involved in a wide range of activities in the shipping, logistics, and the oil and gas industries. The study targeted employees of Maersk in various categories. The researcher wanted to determine the effects of e-logistics on the performance of the logistics functions in Maersk line. Table 4 below represents the departments served by the respondents.

Department	Frequency	Percent	Cumulative Percent
Customer Service	11	15.7	
Sales	14	20.0	15.7
Finance	19	27.1	35.7
Trade and Marketing	4	5.7	62.9
Operations	14	20.0	68.6
Human Resource and Administration	8	11.4	88.6
Total	70	100.0	100.0

Table 4: Departments of the respondents

The results from Table 4 indicated a variety of departments that respondents serve in Maersk Kenya limited. These were not all the departments in the company but represented the departments who were directly involved in administering e-logistics within the organization. The results indicated that respondents who were in customer service were 11 which represented 15.7% of the respondents, those who served in sales were 14 which was represented by 20% of the respondents while those in finance department were 19, represented 27.1% of the respondents. Trade and finance had 4 respondents who were represented by 5.7% response rate. This proved to be the lowest response rate because most of them were not directly involved in e-logistics adoption in the organization. However, their analysis was very important for an organization that wants to position itself competitively in the market. That is why the researcher could not ignore their responses towards the effects of e-logistics on the performance of the logistics function. Those in operations were 14, a 20% response rate while human resource and administration was also represented by 8 respondents which represented 11.4% of the respondents. Majority of the respondents were from finance. This is the department that does all the budgeting and resource allocation within the organization. The introduction of e-logistics is a vital aspect in any organization and needs a lot of funds in order to take place. Finance department was majorly involved because of their role in resource allocation and budgeting. The researcher went further to ascertain the designations of the respondents within these departments and Table 5 had the results.

The researcher also on the other hand wanted to identify the duration with which the respondents had worked in Maersk line. Figure 2 below showed the response.

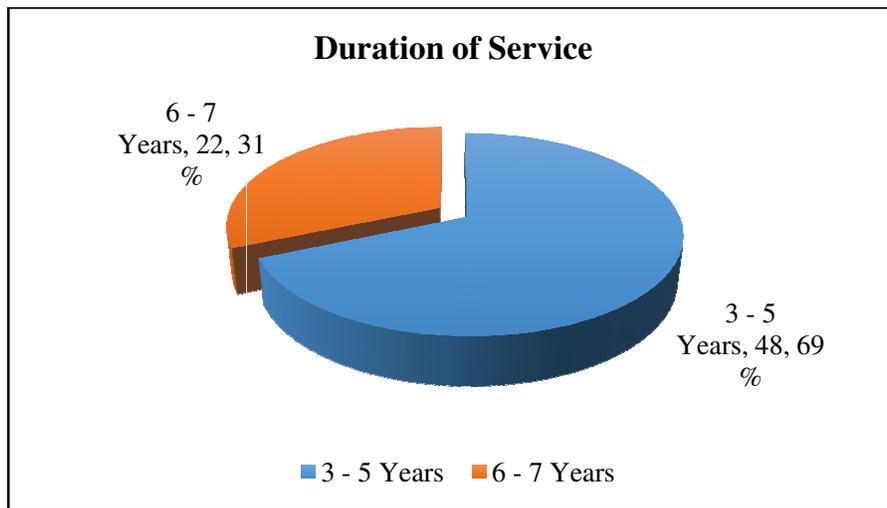


Figure 2: Duration of Service

Results from figure 2 above showed that many of the respondents had worked for quite some time in Maersk line. This was because respondents who had served the company for a period between 3 – 5 years were 48, representing 69% response rate while those who had served the organization for duration between 6 – 7 years were 22 representing a 31% response rate. This was an indication that the respondents had known the organization very well and any response therefore was trusted because they had enough experience with the operations of the organization.

4.4. Results of the Pilot Study

The study involved random selection of 10 members from all the departments. The Cronbach’s alpha was used to test for reliability and validity of the research instruments. The findings are recorded as below:

Variable	Cronbach’s Alpha
E-logistics cost related management	0.701
E-logistics responsiveness	0.723
E-logistics data management	0.789
E-logistics flexibility	0.740

Table 5: Pilot study Results

The results of the pilot study revealed that e-logistics cost related management usage scale had a Cronbach’s reliability of 0.701, e-logistics responsiveness had a reliability alpha value of 0.723, e-logistics data management had a reliability alpha value of 0.789 and e-logistics flexibility had a reliability alpha value of 0.740. This therefore indicated that the research tool was reliable and valid and didn’t need any amendments.

4.5. E-Logistics Cost Related Management

E-Logistics represents a shift in the logistics doctrine that is changing traditional organizational models, business processes, relationships and operational models that have been dominant for the past 20 years. The new doctrine of e-logistics requires an enterprise to integrate and synchronize the strategic vision and tactical delivery of products to its customers with the information technology and service infrastructure needed to meet that vision and process execution. In the next few years, successful enterprises will restructure their organization, process and technology infrastructure for successful e-logistics execution. In a bid to understand how significant e-logistics has positively influenced cost management in the company, the researcher put the respondents into task and figure 3 had the response.

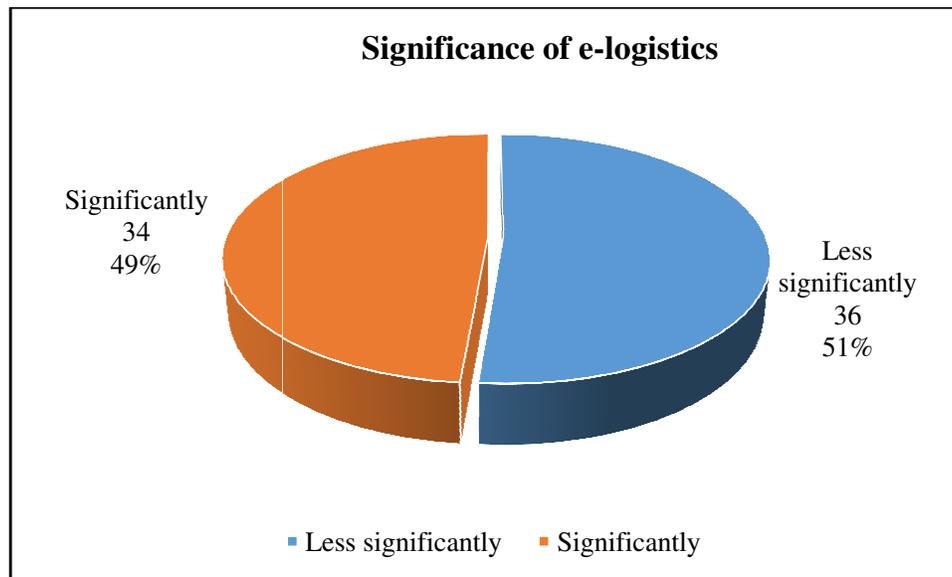


Figure 3: Significance of e-logistics on cost management

The results from figure 3 observe that information technology is now taking significant roles in business processes creating new needs, causing new product development and commanding new procedures. Following full implementation of information technology in an organization, these internal changes may also lead to broader shifts in products, markets, and society as a whole. Information technology plays a crucial role as an enabler in business process renovation. It should be pointed out that a higher level of procedures' automation brings more or less negative results. Even if some of the achievements of such actions are positive, they prevent the managers from seeing all the opportunities offered by the informatization of a redesigned business process and infrastructure role of informatics. This was evident where there was almost a tie to those respondents who believed that e-logistics was significant to cost management with those who indicated that it was less significant. This response prompted the researcher to pose statements to understand the extent to which respondents agreed or disagreed as regards to how e-logistics affected cost management in the organization. Table 6 below had the response.

Statement	Strongly agree		Agree		Not Sure		Disagree		Strongly disagree		TOTAL	
	F	%	F	%	F	%	F	%	F	%	F	%
E-Logistic has enabled easier management of collections	13	19	26	37	24	34	4	6	3	4	70	100
E-Logistic has enabled easier management of payables to suppliers	27	39	35	50	7	10	1	1	-	-	70	100
E-logistics has enhanced internal control to the financial system of the organization	13	19	48	69	7	10	-	-	2	3	70	100
Implementation of e-logistics has reduced operational cost	15	21	38	54	14	20	3	4	-	-	70	100

Table 6: Extent to which e-logistics affected cost management

Results from Table 6 above indicate the extent to which respondents agreed or disagreed on how e-logistics had affected cost management in the organization. Regarding the fact that E-Logistic had enabled easier management of collections of various debts within the organization, 13 respondents who represented 19% of the respondents strongly agreed with the statement while 26(37%) just agreed with the statement. On the other hand, 24(34%) of the respondents were not sure if it really affected cost management, maybe because they had not gotten directly involved in e-logistics cost management or were not aware. The other 4(6%) respondents disagreed with the statement while the rest 3(4%) strongly disagreed with the statement.

On the other hand, the researcher wanted to know the extent to which respondents agreed or disagreed on the fact that e-Logistic has enabled easier management of payables to suppliers. The response was as follows; 27(39%) of them strongly agreed, 35(50%) just agreed, 7(10%) were not sure if really e-logistics enabled easier management of payables to suppliers while only 1(1%) of the respondents disagreed. This was an indication that e-logistics had a great role in enabling easy management of payables to suppliers. Equally, the researcher also wanted to know if respondents agreed or disagreed with the face that e-logistics has enhanced internal control to the financial system of the organization. Types of internal controls include detective controls, designed to detect errors in the business; corrective controls, used to correct errors that are discovered; and preventive controls, used to keep errors from happening in the first place. Common controls include requiring reviews, approvals, verifications, and well-documented reconciliations. Other types of controls used are segregation of duties and periodic reviews or audits.

The purpose of internal controls is to minimize or control risks. As such, internal controls play an important role in detecting and preventing fraud in and organization. They are also the means by which a company protects its resources. This includes both physical resources such as machinery and property and intangible resources such as reputation or intellectual property. Majority of the respondents therefore agreed that e-logistics had an integral role in enhancing the internal control to the financial system of the organization. Only 2(3%) respondents disagreed to the statement. This could have been because their influence to the organization's financial management was minimal.

Further, the researcher went ahead to determine another extent to which respondents agreed or disagreed with the statement that implementation of e-logistics has reduced operational cost. The response elicited various reactions, 15 respondents who represented 21% response rate strongly agreed with the statement while majority of the respondents, 38(54%) agreed. Only 3(4%) of the respondents disagreed. This was therefore an indication that e-logistics can dramatically change the competitive environment of organizations, provide sharp insight, fast response strength, and powerful control of data will be the key factors determining whether at business remains competitive. Using e-logistics, businesses can concentrate on dealing with relevant information, combining orders, controlling cash flow, and returning goods, reacting to and supplying every node within a business's necessary information system immediately. The competitiveness and service strength can be improved greatly. Channeling e-logistics needs is a huge cost, but the government offers the chain store supply chain promotion plan to logistics companies nationally.

Concerning how cost management improved with e-logistics, the researcher wanted to determine if really e-logistics has improved or worsened the cost management in the organization. Table 7 had a summary of the results.

Solution	Frequency	Percent	Cumulative Percent
Payment to vendors is easier and much faster with e-logistics	11	15.7	
It has improved transparency and led to less administrative paperwork.	32	45.7	15.7
Collection of payments is easier and faster. Online invoicing is more efficient as compared to manual invoicing	5	7.1	61.4
It has increased security, efficiency and ensured compliance in financial management	11	15.7	68.6
It has reduced administrative work	11	15.7	84.3
Total	70	100.0	100.0

Table 7: How cost management improved with e-logistics

Results from Table 7 indicates that majority (32, 46%) of the respondents were of the opinion that e-logistics had improved transparency and had led to less administrative paperwork in the organization. This had an indication therefore that e-logistics had made it easy for the respondents in terms of reduction of paper work which was detrimental to the environment. Since to some extent it was difficult for employees to hide any information within the organization, it was evident that e-logistics improved transparency. On the other hand, 11(16%) of the respondents had an opinion that e-logistics had made payment to vendors more easy and much faster while 5(7%) of the respondents indicated that Collection of payments was easier and faster and online invoicing was made more efficient as compared to manual invoicing. Equally, the other 11(16%) of the respondents also indicated that e-logistics had increased security, efficiency and ensured compliance in financial management while the other 11(16%) of them said that e-logistics had reduced administrative work.

The assumptions of this research should prove a paradigm that every product that is sold in the traditional way can be sold on the Web. That involves integration of the offer, the order process, the payment process and other processes in the online sales with the logistics system, as an important element. In traditional sales, a customer buys a physical manifestation of the product, because customer buys the product with the conviction that it serves its purpose, and on the other hand the seller receives equivalent in money for the product. In the virtual world, the subject of the sales relationship is a virtual product and virtual money, and the physical manifestation of the product, its purpose and value, is in charge of logistics. E-Logistics system that supports all the characteristics of electronic commerce, needs to provide and maintain a value for which customer has decided to buy in the electronic way, rather than in the traditional way. The most convenient way to perform logistic activities has been based on moving a large amount of units at the same time to the selected consumers in several geographical places. In the traditional logistics the shipment is followed through the container and pallet, not by the individual unit of goods.

4.6. E-Logistics Responsiveness

In the current competitive environment, many organizations are entering the global arena to gain market share and take advantage of higher production and sourcing efficiencies. E-logistics has brought new challenges, as well as opportunities to logistics management. The cost of logistics and transportation has a large impact on an organization's profitability and the extent to which it can position itself through this competitive market. A global market, outsourcing, and operations place tremendous pressure on the logistics function to deliver the goods as quickly as possible at the lowest cost. Therefore, a key determinant of business performance is the role of the logistics function in ensuring the smooth flow of materials, products and information throughout a company's supply chain.

E-Logistics provides the power of the internet and other technologies to provide enough information to logistics participants and offer unprecedented levels of visibility across the entire logistics supply. Therefore, concerning e-logistics responsiveness, the researcher

pose statements to understand the extent to which respondents agreed or disagreed and their position on them. Table 8 below had the results.

Statement	Strongly agree		Agree		Not Sure		Disagree		Strongly disagree		TOTAL	
	F	%	F	%	F	%	F	%	F	%	F	%
Customers can log in complains online and get service online	17	24	24	34	7	10	11	16	11	16	70	100
The response time is faster online than when manually done	27	39	35	50	7	10	1	1	-	-	70	100
Customers prefer being served online than manually	13	19	48	69	7	10	-	-	2	3	70	100
The cost of employing customer service attendants has reduced while serving them online	15	21	38	54	14	20	3	4	-	-	70	100
Online attendance is more fulfilling than manual attendance	16	23	29	41	18	26	4	5	3	4	70	100
Ability to reach a wider range of customers with online services	24	34	21	30	21	30	2	3	2	3	70	100
The market share has increased with online services	2	3	37	53	22	31	3	4	6	9	70	100
e-logistics is a source of product differentiation in the market	13	19	48	69	7	10	2	3	-	-	70	100
E-logistics has improved customer service delivery efficiency	27	39	35	50	7	10	1	1	-	-	70	100

Table 8: E-logistics responsiveness

The statements posed to respondents regarding e-logistics elicited varied reactions. To begin with, the researcher wanted to know the extent to which the respondents agreed or disagreed on the statement that Customers can log in complains online and get service online. The aim of the statement was to understand how the company has integrated itself with the customer using online measures. About 17(24%) of the respondents strongly agreed with the statement, 24(34%) of the respondents just agreed while 7(10%) of them were not very sure. About 22 respondents disagreed. From this response, it was imperative that e-logistics was the most preferred mean through which the organizations channelled their activities to their customer. A customer is an integral entity to any organization and therefore must seek for means of ensuring that they are satisfied at all cost.

To this regard, the researcher also wanted to know the extent to which respondents agreed or disagreed to the fact that the response time was faster online than when manually done. Majority of the respondents, above 50% actually did agree with the statement. Only 1(1%) respondent disagreed, an indication that online transactions greatly reduce the response time than when manually done. The cost of employing customer service attendants had reduced while serving them online. This was evident because majority (38, 54%) of the respondents agreed while 15(21%) strongly agreed with the statement. On the other hand, the researcher wanted to know e-logistics had opened a wide range of customers with online services. Majority of the respondents also agreed with this statement, an implication that e-logistics was so much favoured by the respondents that doing activities manually.

The organization's data management and integration plays an expanding role in logistics. From these results, it can be seen that customers will always want (and get) full end-to-end control of the delivery process, allowing them, for example, to change destinations in real time. This shift will require logistics providers to be fully integrated along the whole value chain, with a constant, real-time interface for the customer. Who owns the customer could be up for grabs as a result: While e-logistics seeks to control all customer communication (and contact), end-to-end logistics players can take advantage of their physical customer touch points. By generating insights into customers' behaviour patterns and preferences, e-logistics can improve their own services, such as preferred delivery time windows.

Finally, the researcher also wanted to identify the extent to which respondents agreed or disagreed with the position that e-logistics is a source of product differentiation in the market and if it has improved customer service delivery efficiently. A business cannot succeed without customers. What's a product without a customer to buy it, or a service without a customer to serve? It's how companies use those products and services to get, keep and grow customers that counts. For this reason, the ability to more effectively market to, sell to and serve customers has made its way to the centre of corporate strategy. That is the reason as to why most of the respondents agreed on ensuring that e-logistics is manifested in their company. Majority of the respondents strongly agreed with the statement.

4.7. E-logistics Data Management

Data management, reliability and the accuracy of logistics and supply chain information are critical to any organization. Inaccurate, incomplete and untimely data management can be one of the biggest challenges when it comes to effectively exchanging information between the organization, its suppliers, logistics providers and even transportation carriers. The view of the researcher was to identify how e-logistics had enabled proper data management within Maersk Kenya Limited. Figure 4 indicated how respondents could describe the quality of decisions made on the basis of data collected using e-logistics.

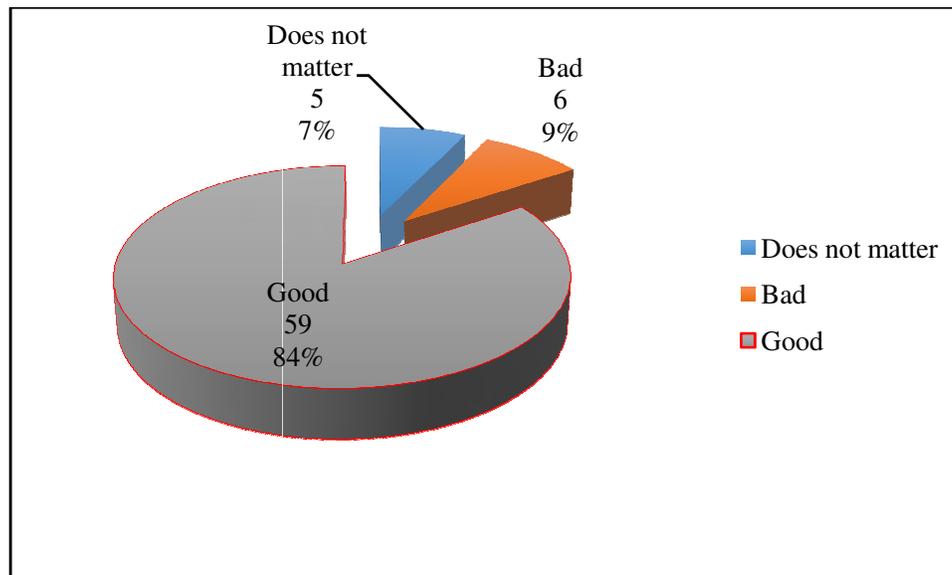


Figure 4: Quality of decisions made using e-logistics

The findings from figure 4 indicates that e-logistics is an important tool in decision making of an organization. The time frame between the start of the decision making and the implementation has always been greatly reduced by the use of e-logistics. This was because majority of the respondents, (59, 84%) indicated that the quality of the decisions made on the basis of data collected using e-logistics was good, 6(9%) of the respondents indicated that it was bad while the rest 5(7%) indicated that it didn't matter to them. E-Logistics leverages the power of the internet and other technologies (such as wireless) to provide robust information to supply chain participants and offer unprecedented levels of visibility across the entire supply chain. This prompted the researcher to pose statements to understand to what extent the respondents agreed or disagreed in regards to e-logistics data management. Table 9 had the response.

Statement	Strongly agree		Agree		Not Sure		Disagree		Strongly disagree		TOTAL	
	F	%	F	%	F	%	F	%	F	%	F	%
Coordination is easier with online sharing of information compared to sharing it manually	24	34	39	55			3	4	4	6	70	100
Accuracy of information is better with e-logistics compared to manual documentation	39	56	12	17	11	16	4	6	4	6	70	100
Timeliness of information has improved with e-logistics	29	41	24	34	11	16	3	4	3	4	70	100
Visibility of data has been enhanced with e-logistics	31	44	35	50	-	-	2	3	2	3	70	100
Data is more secure with e-logistics than manual documentation	27	39	25	36	11	16	3	4	4	6	70	100
Data organization is easier with e-logistics	42	60	23	33	3	4	2	3	-	-	70	100

Table 9: E-Logistics Data Management

E-logistics has not only revolutionized the way goods are sold, but how they are delivered to the final consumer. The tenets of one-to-one marketing those firms adopting e-logistics must be carried over to their fulfilment operations. Customers demand customized products delivered at very high speed with complete order flexibility and convenience. Today's online customers want to be able to track their orders instantly from the moment they click the Buy button until the moment the package arrives at their doorsteps, and be able to reroute packages, determine delivery costs and time-in-transit, and break up their orders for multiple ship-to addresses. The shift of power from the seller to the buyer is creating a new era of expectations, and buyers - whether they are consumers or businesses will not tolerate experiences such as partial shipments of goods on an instalment basis or poor product return policies. Coordination is easier with online sharing of information compared to sharing it manually. Majority of the respondents (39, 55%) agreed with the statement while 24(34%) of the respondents strongly agreed. This was an indication that e-logistics had integrated the coordination of activities within the organization.

On the other hand, accuracy of information was better with e-logistics as compared to manual documentation. This was because also majority of the respondents had strongly agreed (39, 56%) with the statement while 12(17%) of the respondents agreed. A good e-logistics management is heavily reliant on the availability of accurate information. E-logistics plays a major role in bringing all

parties, including customers and suppliers, to a single platform in an integrated logistics system to provide cost-effective and quality logistics services. The importance of e-logistics in the logistics management is highlighted by the fact that customers can track, trace and generate advanced logistics reports so that timely decisions can be made and corresponding actions taken. Many companies are trying to develop a seamless information system so that more accurate and timely information can be exchanged to help decision-making and provide competitive logistics services.

The timeliness of the information was also favoured since majority (29, 41%) of the respondents strongly agreed while 24(34%) agreed on the same. The integration of e-logistics leads to global inventory visibility which, in turn, leads to reduced costs and improved customer services by decreasing shipping and receiving cycle times, increasing shipment and inventory accuracy. Therefore, visibility of data has been enhanced by e-logistics, a statement that was strongly agreed and just agreed with majority (35, 50%) of the respondents. Data is more secure with e-logistics than manual documentation. This statement was strongly agreed with majority of the respondents (27, 39%) and also agreed by the other 36% of the respondents. About 6% of the respondents disagreed, most likely because they had not used e-logistics before and were still on manual documentation.

The researcher went further to identify in the respondent's opinion, how had data management improved with e-logistics. The results were tabulated in Table 10 below.

How it has improved	Frequency	Percent	Valid Percent	Cumulative Percent
It has improved visibility in data management	13	18.6	18.6	
Accessibility has improved; Employees can work from home or away from the office.	12	17.1	17.1	18.6
It has improved on the easy management of data within the organization	11	15.7	15.7	35.7
It has enabled easy cooperation among the staff	16	22.9	22.9	51.4
It has enhanced viability of data within the organization	18	25.7	25.7	74.3
Total	70	100.0	100.0	100.0

Table 10: How data management improved with e-logistics

Regarding the fact that e-logistics has improved data management, results from Table 10 indicate that e-logistics has enhanced visibility of data within the organization. This was shown by majority (26%) of the respondents. This was followed by 23% of the respondents who had an opinion that e-logistics had enabled easy cooperation among the staff. On the other hand, 17% of the respondents indicated that the use of e-logistics had improved accessibility, employees can work from home or away from the office.

4.8. E-Logistics Flexibility

To be useful in achieving company objectives, flexibility should be viewed from satisfying customer needs perspective rather than from an equipment or process perspective. From a customer's perspective, cross-functional and cross-company efforts are needed to eliminate bottlenecks, increase responsiveness, and create a level of performance that enables firms to build lasting competitive advantage. Therefore, e-logistics flexibility is including product development, manufacturing, logistics flexibilities. Flexibility is the ability to change or react with little penalty in time, effort, cost or performance. Flexibility can improve the company's competitiveness, particularly for the decision-making process of implementing technologies. But managers do not have a comprehensive view of flexibility because they focus more on machine flexibility than on total system flexibility. Flexibility in e-logistics adds the requirement of flexibility within and between all partners in the organization, including departments within an organization, and the external partners, including suppliers, carriers, third-party companies, and information systems providers. It includes the flexibility to gather information on market demands and exchange information between organizations. In order to understand the feelings of the respondents, the researcher sought their opinions if Maersk Kenya Ltd had become more flexible with adopting to changes in the environment with the use of e-logistics. All the respondents overwhelmingly agreed with the statement. The respondents were therefore asked to show the extent to which they agreed or disagreed with statements regarding e-logistics flexibility. Table 11 shows the results.

Statement	Strongly agree		Agree		Not Sure		Disagree		Strongly disagree		TOTAL	
	F	%	F	%	F	%	F	%	F	%	F	%
E-logistics helps to reduce the cost implication of changing vessel schedules	28	40	33	47	5	7	-	-	4	6	70	100
E-logistics helps to reduce the time implication of changing vessel schedules	27	39	39	56	-	-	1	1	3	4	70	100
E-logistics helps to deliver urgent requests to customers i.e. delivery orders and booking confirmations	29	41	24	34	11	16	3	4	3	4	70	100
E-logistics helps to easily manage the varying number of delivery modes available per product for intermodal logistics	31	44	35	50	-	-	26	3	2	3	70	100
E-logistics allows more flexibility with pricing management	30	43	27	39	5	7	4	6	4	6	70	100
E-logistics makes it easier to change the product hence offering better service flexibility	29	42	27	39	6	9	3	4	3	4	70	100
E-logistics enables more flexibility with working arrangement; i.e. working away from the office	35	50	21	30	10	15	2	3	2	3	70	100

Table 11: E-logistics Flexibility

Beyond the obvious benefits of e-logistics across the whole organization, access to accurate, real-time logistics information provided by the use of e-logistics allows companies to undertake various improvement initiatives that can drive savings, increase revenues and improve their overall competitive advantage. Based on respondent's results estimates and experience, Maersk Kenya Limited Company has undertaken such initiative and e-logistics has enabled it to reduce the cost implication of changing vessel schedules. This was because majority of the respondents (33, 47%) agreed while 28(40%) of them strongly agreed. On the other hand, majority of the respondents also agreed that E-logistics helps to reduce the time implication of changing vessel schedules, E-logistics helps to deliver urgent requests to customers i.e. delivery orders and booking confirmations and E-logistics helps to easily manage the varying number of delivery modes available per product for intermodal logistics. The response rates further showed that a majority of the respondents agreed that E-logistics allows more flexibility with pricing management makes it easier to change the product and enables more flexibility with working arrangements

4.9. Logistical Performance

Companies work with numerous data, information about production, output, etc., and they use different indicators assessing costs and the profit making activity of the employees, machines, etc. With e-logistics performance measuring the management can inform especially the owners and the employees about how the firm works. The philosophy of performance management in the logistics functions appears at this level. Performance management in the logistics function is a process which deals with mainly motivating the employees in order to reach the strategic goals of the firm. The Logistics function in various organizations is made up of people, processes and systems working together to support efficient and effective delivery of services. Controls are normally put in place to monitor weaknesses, poor designs in projects and improper implementation of programs. Based on continuous monitoring, these weaknesses against targets set can be corrected or revised in order to continually improve performance, thus reducing the risk of exposure and strengthening the response to needs.

4.9.1. E-logistics and Logistical Performance

In a bid to find the relationship between e-logistics functions and logistical performance, the researcher did a correlation of all the four independent variables against the dependent variable and the results were indicated in Table 12

		Logistical Performance	E-logistics cost related management	E-logistics responsiveness	E-logistics data management	E-logistics flexibility
Logistical Performance	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	70				
E-logistics cost related management	Pearson Correlation	.206**	1			
	Sig. (2-tailed)	.004				
	N	70	70			
E-logistics responsiveness	Pearson Correlation	.871**	.065	1		
	Sig. (2-tailed)	.000	.365			
	N	70	70	70		
E-logistics data management	Pearson Correlation	.035	-.145*	.055	1	
	Sig. (2-tailed)	.629	.043	.449		
	N	70	70	70	70	
E-logistics flexibility	Pearson Correlation	.126	.031	.156*	.632**	1
	Sig. (2-tailed)	.079	.665	.030	.000	
	N	70	70	70	70	70

Table 12: Correlation between independent variables and dependent variable

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

* Correlation is significant at the 0.05 level (2-tailed).

The researcher, out of the correlation in Table 12 found out that all the four independent variables positively influenced the performance of logistics functions, however at different levels. It was noted that among the four actors, e-logistics responsiveness had a higher positive significance impact to logistical performance with a significance level of 0.871 which is significantly different from 0 because it is greater than 0.10. This was followed by e-logistics cost related management with a significance level of 0.206 which is also significantly different from 0 because it is greater than 0.10. The third one was e-logistics flexibility which had a significance level of 0.126 which was equally greater than 0.10. E-logistics data management had the least significance level which was 0.035. Although it had a positive relation to logistics performance, it was insignificant. The results therefore indicate E-logistics responsiveness affects logistical performance more than the other variables and organisations should be keener in investing in e-logistics in customer service.

5. Summary, Conclusion and Recommendation

5.1. Introduction

This chapter gives a summary of the findings of the study in light of the objectives set forth in chapter one. In addition, the chapter discusses the conclusion, recommendations and suggests areas for further study.

5.2. Summary of the Findings

The study examined the e-logistics on the logistical performance of a logistics firm. It was guided by the following objective; to analyse the effect of e-logistics cost-related management on the logistical performance of logistic firms; to establish the effect of e-logistics responsiveness on the logistical performance of logistic firms; to investigate the effect of e-logistics data management on the logistical performance of logistic firm; to examine the effect of e-logistics flexibility on the logistical performance of logistic firms. Data was collected from 70 respondents divided into different strata at Maersk Kenya Limited whereby the divisions were according to their working departments.

The researcher began by seeking to identify the duration with which the respondents had worked in Maersk Kenya limited. The results showed that 69% of the population had worked for 3-5 years while the remaining 31 % had worked for 6-7 years. This was an indication that the respondents had known the organization very well and any response therefore was trusted because they had enough experience with the operations of the organization. The researcher sought to know how significantly e-logistics has influenced cost management. 49% of the respondents believed that e-logistics was significant while the remaining 51% thought that it was less significant.

Regarding the fact that e-logistics had enabled easier management of collections of various debts within the organization, 13 respondents who represented 19% of the respondents strongly agreed with the statement while 26(37%) just agreed with the statement. On the other hand, 24(34%) of the respondents were not sure if it really affected cost management, 4(6%) respondents disagreed with the statement while the rest 3(4%) strongly disagreed with the statement. On the other hand, the researcher wanted to know the extent to which respondents agreed or disagreed on the fact that e-logistics has enabled easier management of payables to suppliers. The response was as follows; 27(39%) of them strongly agreed, 35(50%) just agreed, 7(10%) were not sure if really e-logistics enabled easier management of payables to suppliers while only 1(1%) of the respondents disagreed.

The researcher also wanted to know if respondents agreed or disagreed with the fact that e-logistics has enhanced internal control to the financial system of the organization. 13 respondents who represented 19% of the respondents strongly agreed with the statement while 48(69%) just agreed with the statement. On the other hand, 7(10%) of the respondents were not sure if it really affected cost management while the rest 2(3%) strongly disagreed with the statement. Further, the researcher went ahead to determine another extent to which respondents agreed or disagreed with the statement that implementation of e-logistics has reduced operational cost. The response elicited various reactions, 15 respondents who represented 21% response rate strongly agreed with the statement while majority of the respondents, 38(54%) agreed. Only 3(4%) of the respondents disagreed.

In regards to e-logistics responsiveness, the researcher wanted to know the extent to which the respondents agreed or disagreed on the statement that Customers can log in complains online and get service online. About 17(24%) of the respondents strongly agreed with the statement, 24(34%) of the respondents just agreed while 7(10%) of them were not very sure. About 22 respondents disagreed. To this regard, the researcher also wanted to find out the extent to which respondents agreed or disagreed to the fact that the response time was faster online than when manually done. The response was as follows; 27(39%) of them strongly agreed, 35(50%) just agreed, 7(10%) were not sure if the response time was faster with e-logistics while only 1(1%) of the respondents disagreed. In regards to whether the cost of employing customer service attendants had reduced while serving them online. This was evident because majority (38, 54%) of the respondents agreed while 15(21%) strongly agreed with the statement.

On the other hand, the researcher wanted to know e-logistics had opened a wide range of customers with online services. Majority (39, 56%) of the respondents also agreed with this statement while 22(31%) were not sure the remaining 9(13%) disagreed with this statement. In regards to whether the market share had increased with implementing e-logistics, majority 39(56%) agreed with the statement, 22(31%) were not sure while 9(13%) disagreed with the statement. The researcher also wanted to identify the extent to which respondents agreed or disagreed with the position that e-logistics is a source of product differentiation in the market. The response was as follows; 13(19%) of them strongly agreed, 48(69%) just agreed, 7(10%) were not sure if e-logistics was a source of product differentiation while only 2(3%) of the respondents disagreed. The researcher also sought to discover the extent to which respondents agreed or disagreed with the position that e-logistics has improved customer service delivery efficiency. Majority 62(89%) agreed with this statement while 7(10%) were not sure and the other 1% disagreed with this statement.

On e-logistics data management, the researcher sought to find out the quality of decisions based on data collected using e-logistics. Majority of the respondents, (59, 84%) indicated that the quality of the decisions made on the basis of data collected using e-logistics was good, 6(9%) of the respondents indicated that it was bad while the rest 5(7%) indicated that it didn't matter to them. The researcher wanted to find out if co-ordination is easier with online sharing of information as compared to sharing it manually. Majority of the respondents (39, 55%) agreed with the statement, 24(34%) of the respondents strongly agreed while 3(4%) disagreed and 4(6%) strongly disagreed with the statement. The researcher wanted to determine if accuracy of information was better with e-logistics as compared to manual documentation. Majority of the respondents had strongly agreed (39, 56%) with the statement, 12(17%) of the respondents agreed, 11(16%) were not sure, 4(6%) disagreed and 4(6%) strongly disagreed.

The timeliness of the information with e-logistics was favoured since majority (29, 41%) of the respondents strongly agreed, 24(34%) agreed on the same while 11(16%) were not sure, 3(4%) disagreed and 3(4%) strongly disagreed. In regards to whether the visibility of data has been enhanced by e-logistics, the response was as follows; 29(41%) of them strongly agreed, 24(34%) just agreed, 11(16%) were not sure while only 3(4%) disagreed and 3(4%) strongly disagreed. The researcher also wanted to determine if data was more secure with e-logistics as compared to manual documentation. This statement was strongly agreed with majority of the respondents (27, 39%) and also agreed by the other 36% of the respondents while 6% of the respondents disagreed. The researcher also wanted to discover if data organization was easier with e-logistics as compared to manual documentation. The response was as follows; 42(60%) of them strongly agreed, 23(33%) just agreed, 3(4%) were not sure while only 2(3%) disagreed.

In regards to e-logistics flexibility, the researcher wanted to find out if Maersk Kenya Ltd had become more flexible with adopting to changes in the environment with the use of e-logistics. All the respondents overwhelmingly agreed with the statement. On the extent to which e-logistics helps to reduce the cost implication of changing vessel schedules, this statement was strongly agreed with majority of the respondents (28, 40%), those who agreed were 33 at 47%, those not sure at 7% and those who disagreed at 6%. The researcher also wanted to find out whether E-logistics helps to reduce the time implication of changing vessel schedules. The results were as follows; 27(39%) of them strongly agreed, 39(56%) just agreed, 1(1%) disagreed while 3(4%) strongly disagreed. E-logistics

helps to deliver urgent requests to customers i.e. delivery orders and booking confirmations was another statement. Majority (29, 41%) of the respondents strongly agreed, 24(34%) just agreed, 11(16%) were not sure, 3(4%) disagreed and 3(4%) strongly disagreed. Some of the respondents (31,44%) also agreed that e-logistics helps to easily manage the varying number of delivery modes available per product for intermodal logistics, 35(50%) agreed while 2(3%) disagreed while 2(3%) strongly disagreed.

The researcher also sought out to find out whether e-logistics allowed more flexibility with pricing management. Majority (30, 43%) of the respondents strongly agreed, 27(39%) just agreed, 5(7%) were not sure, 4(6%) disagreed and 4(6%) strongly disagreed. E-logistics makes it easier to change the product hence offering better service flexibility was another statement. Majority (29,42%) of the respondents strongly agreed, 27(39%) just agreed, 6(9%) were not sure, 3(4%) disagreed and 3(4%) strongly disagreed. It was also discovered by the researcher that e-logistics enables more flexibility with working arrangements i.e. working away from the office. This is because of the majority of the respondents strongly agreed 42%, while 39% agreed, 9% were not sure, 4% disagreed while 4% were strongly disagreed.

The researcher found out that all the four independent variables positively influenced the performance of logistics functions, however at different levels. It was noted that among the four actors, e-logistics responsiveness had a higher positive significance impact to the performance of logistics functions with a significance level of 0.871 which is significantly different from 0 because it is greater than 0.10. This was followed by e-logistics cost related management with a significance level of 0.206 which is also significantly different from 0 because it is greater than 0.10. The third one was e-logistics flexibility which had a significance level of 0.126 which was equally greater than 0.10. E-logistics data management had the least significance level which was 0.035.

5.3. Conclusions

The study examined the effects of e-logistics on the logistical performance of logistic firms. On the effects of e-logistics cost related management on logistical performance, the results of the study revealed the following:

- i. E-logistics cost related management was significant to the organization as almost all the correspondents agreed with this statement.
- ii. It can also be concluded that e-logistics ensures easier management of collections and payables to suppliers as a majority of the respondents agreed with this statement.
- iii. This was an indication from the results of the study that e-logistics had an integral role in enhancing the internal control to the financial system of the organization as majority of the respondents agreed with this statement.
- iv. E-logistics can reduce the operational costs as it reduces the administrative work of managing costs in the organization.

On e-logistics responsiveness, the researcher posed statements to understand the extent to which respondents agreed or disagreed and their position on them. The following were the conclusions:

- i. Majority of the respondents agreed on the statement that customers can log in complains online and get services online.
- ii. It can also be concluded from the study that response time was faster online than when manually done.
- iii. The cost of employing customer service attendants had reduced while serving customers online as there was a majority positive response on the statement.
- i. It is also evident from the study that e-logistics had opened a wide range of customers with online services and it was more fulfilling for the customers to be served online rather than manually. This is a majority of the respondents concurred with this statement.
- ii. It was also deduced from the outcome of the study that e-logistics is a source of product differentiation and can improve customer service delivery efficiency.

On e-logistics data management, the following deductions were made:

- i. The quality of decisions was good with e-logistics as a majority of the respondents agreed with this statement.
- ii. It was deduced from the outcome of the study that co-ordination is easier with online sharing of information compared to sharing it manually.
- iii. It was also concluded from the study that accuracy and timeliness of information was better with e-logistics as compared to manual documentation as a majority of the respondents agreed with this statement.
- iv. Visibility of data was enhanced by e-logistics, a statement that was strongly agreed and just agreed with majority of the respondents.
- v. Data is more secure with e-logistics than manual documentation as evident from the results of the study.

In regards to e-logistics flexibility, the researcher concluded the following:

- i. That Maersk Kenya Ltd had become more flexible with adopting to changes in the environment with the use of e-logistics. All the respondents overwhelmingly agreed with the statement.
- ii. It can be deduced from the study that e-logistics can play a great role in reducing the cost and time implication of changing vessel schedules as a majority of the respondents agreed with these statements.
- iii. There was an indication from the outcome of the study that e-logistics can deliver urgent requests to customers and help to easily manage the varying number of delivery modes available per product for intermodal logistics.
- iv. The response rates further showed that a majority of the respondents agreed that e-logistics allows more flexibility with pricing management makes it easier to change the product and enables more flexibility with working arrangements.

From the correlation results, it was evident that there exists a positive relationship all the four independent variables and logistical performance. It can be deduced that e-logistics cost management, e-logistics data management, e-logistics responsiveness and e-logistics flexibility can positively influence logistical performance.

5.4. Recommendations

Based on the conclusions, the following recommendations were made on effects of e-logistics cost related management on logistical performance:

- i. E-logistics cost related management is significant to the organization and can affect logistical performance.
- ii. E-logistics should be employed in management of collections and payables and it makes it easier and more efficient.
- iii. E-logistics should be used to enhance the internal control of the financial system as it ensures compliance to rules and policies.
- iv. Logistic firms should invest in e-logistics as it reduces operational costs by reducing administrative paper work.

Following the conclusions on the effects of e-logistics responsiveness on logistical performance, the following are the recommendations;

- i. Accessibility of online services allows cooperation in real time and creates an integrated supply chain which allows accessibility to information and logistics firms should therefore adopt e-logistics in order to improve information flow in the organization.
- ii. The response time is faster with e-logistics hence it can provide faster response to customer needs which is a requirement for survival in the competitive logistics sector.
- iii. E-logistics helps to streamline and automate business process to improve efficiency and keep costs low and should be implemented by logistic firms as it makes customer service more cost effective.
- iv. E-logistics increases the number of channels through which you interact with customers and the complexity of those interactions and thus opens a wide range of customers for logistics firm and should therefore be implemented for firms that would want to be competitive in the market.
- v. Logistic firms should use e-logistics as a source of product differentiation as it helps to gain insights into the business from customer data and therefore allows more effective target marketing.

The recommendations for the study of the effects of e-logistics data management on the performance of the logistics function include:

- i. Logistic firms should use e-logistics in decision making as it provides effective collaborative forecasting and decision support,
- ii. E-logistics allows better coordination as sharing of information online is easier and faster as compared to when manually done. These documents become instantly available to everyone in the company, regardless of their geographical location. Companies are able to store and maintain a tremendous amount of historical data economically, and employees benefit from immediate access to the documents they need.
- iii. E-logistics improves the accuracy and timeliness of information as compared to manual documentation and logistic firms should therefore implement it.
- iv. Visibility of data can be enhanced by e-logistics and logistic firms should therefore implement it. Companies can track data, expenses and productivity levels. The information can be used to track profitability over time, maximize return on investment and identify areas of improvement.
- v. Data is more secure with e-logistics than manual documentation and logistic firms should use this to store their data. Databases can largely be secured against hackers through network security measures such as firewalls, and network-based intrusion detection systems.

Following the conclusions on the effects of e-logistics flexibility on logistical performance, the following are the recommendations;

- i. E-logistics helps organisations to be more flexible to changes in the environment by enabling provision of individualized treatment and a decentralized and dynamic environment. Logistic firms should therefore be keen to invest in e-logistics.
- ii. E-logistics helps to cope with changes in place and time and this is important for the logistics environment that is dynamic and unpredictable.
- iii. E-logistics provides a fast response and individualized treatment hence able to cope with delivering urgent orders to customers. This is an essential benefit for logistic firms.
- iv. Customer relationship management in e-logistics is demand driven and makes use of market intelligence analysis. This makes it easier to adjust the prices to suit the market conditions which is important for the dynamic logistics sector.

5.5. Areas of Further Research

The following are the areas recommended for further research based on this study:

- i. It is recommended that the study is replicated in other logistic sectors such clearing and forwarding, warehousing, manufacturing companies in order to establish whether e-logistics has the same effect on logistical performance as the shipping industry.
- ii. Factors affecting adoption of e-logistics by logistics firms in Kenya
- iii. The adoption strategies of e-logistics by logistic firms in Kenya.

6. Acronyms

- B2B : Business to Business
- BTRE : Bureau of Transport and Regional Economics
- CRM : Customer Relationship Management
- ECRM : Electronic Customer Relationship Management

- ECTS : Electronic Cargo Tracking Systems
- EDI : Electronic Data Interchange
- ERP : Enterprise Resource Planning
- GPS : Global Positioning Systems
- ICT : Information and Communication Technology
- IS : Information System
- IT : Information Technology
- KRA : Kenya Revenue Authority
- LIS : Logistics Information Systems
- LSP : Logistics Service Provider
- NT : Network Theory
- RBV : Resource Based View
- RFID : Radio Frequency Identification
- RSC : Responsive Supply Chain
- SAP : Systems, Applications & Products
- SC : Supply chain
- SCM : Supply Chain Management
- SMES : Small and Medium sized enterprises
- SPSS : Statistical Package for Social Sciences
- SWS : Single Window Systems
- TCT : Transaction Cost Theory
- TPL : Third Party Logistics
- UNCTAD: United Nations Conference on Trade and Development
- USAID : United States Agency for International Development
- VDO : Vehicle Display Output

7. Definition of Terms

- i. Conceptual framework: It is a visual or written product, one that, “explains either graphically or in narrative form, the main things to be studied, concepts, or variables and the presumed relationship among them (Lee & Wang, 2001).
- ii. E-logistics: It is the process necessary to transfer the goods sold over the internet to customers (Auramo, 2001).
- iii. Logistics: It is part of the supply chain process that plans, implements and controls the efficient, effective flow and storage of goods and services and related information from the point of origin to the point of consumption in order to meet the customer’s requirements (Ayer, 2001).
- iv. Logistics data management: This entails the collection, review, aggregation, analysis, and interpretation of logistics data and the development and dissemination of logistics data reports (USAID, 2010).
- v. Network theory: It is a theory that is used to provide a basis for the conceptual analysis of reciprocity in co-operative relationships between supply chain partners (Oliver, 1990).
- vi. Resource based view theory: This theory emphasizes the firm’s resources as the fundamental determinants of competitive advantage and performance (Barney, 1991).
- vii. Responsive supply chain: This is a network of firms that is capable of creating wealth to its stakeholders in a competitive environment by reacting quickly and cost effectively to changing market requirements (Gunasekaran et al., 2007).
- viii. Transaction cost theory: It is a theory that explains the costs of doing activities internally versus the cost related to buying the same goods or services in the market and its goal is to maximize performance by minimizing transaction costs within and between organizations (Williamson,1985).

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APPENDICES

Appendix 1: Introduction Letter

RE: COLLECTION OF DATA

I'm a student at Jomo Kenyatta University of Agriculture and Technology (JKUAT) pursuing Masters of Science in Procurement and Logistics Degree. I'm currently undertaking a research project on **“EFFECTS OF ELECTRONIC LOGISTICS ON THE LOGISTICAL PERFORMANCE OF LOGISTICAL FIRMS IN KENYA A CASE STUDY OF MAERSK KENYA LIMITED”** which is a requirement so that I can be awarded my Masters degree. I'm therefore seeking your assistance to fill the questionnaires attached.

All the information given will be held confidential and will only be used for educational purpose only.

Kind Regards,

Agnes Kasyoka Kithiia

Appendix 2: Questionnaire

Dear respondent, I'm conducting a research study on the effects of e-logistics on performance of the logistics function in Maersk line. The questionnaire items are about the study and you are kindly requested to participate in responding to the questions below. The information given will be treated as confidential and the results of the study will be used for academic research purposes only.

Instructions for filling the questionnaire: Please, where choices are provided, tick your preferred selection in the box provided under the heading “response”. Where your opinion is required, candidly state your views as precisely and honestly as you can.

1. Section A: Bio Data

I. Organisation name: _____

II. Department:

Department	Response (Tick)
Customer service	
Sales	
Finance	
Trade and marketing	
Operations	
Human resource & Administration	

III. Designation: _____

IV. How many years have you worked in Maersk l

- a) Less than 3yrs ()
- b) 3-5years ()
- c) 6-7 years ()
- d) Above 8 years ()

2. Section B- E-Logistics Cost Related Management

I. Indicate how significantly e-logistics has positively influenced cost management in the company?
(4 = very significantly, 3 = significantly, 2= less significantly and 1=not at all)

1	2	3	4

II. Using a scale of 1 to 5 Tick as an appropriate using the key; where 1-strongly agree, 2- agree, 3- Not sure, 4- disagree, 5- strongly disagree. To what extent does e-logistics affect cost management?

	1	2	3	4	5
E-logistic has enabled easier management of collections					
E-logistics has enabled easier management of payables to suppliers					
Implementation of E-logistics has reduced operational cost					
E-logistics has enhanced internal control of the financial system of the organisation					

111. In your opinion how has cost management improved with e-logistics?

3. Section C: E-Logistics Responsiveness

I. Using a scale of 1 to 5 Tick as an appropriate using the key; where 1-strongly agree, 2- agree, 3- Not sure, 4- disagree, 5- strongly disagree. To what extent does e-logistics affect responsiveness in logistics?

	1	2	3	4	5
Customer can log in complains online and get service online					
The response time is faster online than when manually done					
Customers prefer being served online than manually					
The cost of employing customer service attendants has reduced while serving them online					
Online attendance is more fulfilling than manual attendance					
Ability to reach a wider range of customers with online services					
The market share has increased with online services					
E-logistics is a source of product differentiation in the market					
E-logistics has improved customer service delivery efficiency					

4. Section D: E-Logistics Data Management

I. How would you describe the quality of decisions made on the basis of data collected using e-logistics?
(4 = very good, 3 = good, 2= bad and 1=does not matter)

1	2	3	4

II. Using a scale of 1 to 5 Tick as an appropriate using the key; where 1-strongly agree, 2- agree, 3- Not sure, 4- disagree, 5- strongly disagree. To what extent do you agree with the following statements in regards to e-logistics data management?

	1	2	3	4	5
Coordination is easier with online sharing of information compared to sharing it manually					
Accuracy of information is better with e-logistics compared to manual documentation					
Timeliness of information has improved with e-logistics					
Visibility of data has been enhanced with e-logistics					
Data is more secure with e-logistics than manual documentation					
Data organisation is easier with e-logistics					

III. In your opinion how has data management improved with e-logistics?

5. Section E: E-Logistics Flexibility

I. In your opinion has Maersk Kenya ltd become more flexible with adapting to changes in the environment with the use of e-logistics?

Yes	No	Not Sure

II. Using a scale of 1 to 5 Tick as an appropriate using the key; where 1-strongly agree, 2- agree, 3- Not sure, 4- disagree, 5- strongly disagree. To what extent do you agree with the following statements in regards to e-logistics flexibility?

	1	2	3	4	5
E-logistics helps to reduce the cost implication of changing vessel schedules					
E-logistics helps to reduce the time implication of changing vessel schedules					
E-logistics helps to deliver urgent requests to customers i.e. delivery orders and booking confirmations.					
E-logistics helps to easily manage the varying number of delivery modes available per product for intermodal logistics					
E-logistics allows more flexibility with pricing management					
E-logistics makes it easier to change the product hence offering better service flexibility					
E-logistics enables more flexibility with working arrangements i.e working away from the office					

III. In your opinion how has Maersk become more flexible with adapting to changes in the environment with the use of e-logistics?

6. Section F; Performance of the Logistics Function

I. Indicate the average sales increase in your company over the following years:

Average sales per year (Kshs)

- After E-logistics Adoption
 - 2013 []
 - 2012 []
 - 2011 []
- Before E-logistics adoption
 - 2010 []
 - 2009 []
 - 2008 []

Indicate the operational cost increase in your company over the following years:

- After E-logistics Adoption
 - 2013 []
 - 2012 []
 - 2011 []
- Before E-logistics adoption
 - 2010 []
 - 2009 []
 - 2008 []

II. The following areas compare your firm performance with other firm in the industry. Tick as appropriate which you feel best estimates how your firm currently compares to other firms in the industry on each item.

	Lowest (0%-20%)	Lower (20%-40%)	Mid (40%-60%)	Next (60%-80%)	Top (80%-100%)
After tax return on total assets					
After tax return on total sales					
Overall competitive position					
Return on investment					
Overall logistics performance					
Firms total sales growth					

III. In your opinion how has the performance of the logistics function improved with e-logistics?
