

**INFORMATION TECHNOLOGY AND PERFORMANCE OF SUPPLY  
CHAIN MANAGEMENT: A CASE STUDY OF INTERNATIONAL  
ENERGY TECHNIK LTD**

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**DECLARATION**

This research project is my original work and has not been presented for award of any degree in any other university

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This project has been submitted for examination with my approval as university of Nairobi supervisor.

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Date.....

## **DEDICATION**

This is a dedication to my Loving parents; Belina Wanjiru and Peter Muriuki, My loving Brothers Paul and Michael and My sisters Sophia and Lillian. They were a great support throughout the whole MBA process.

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## **ABSTRACT**

The purpose of this study was to determine the benefits of Information Technology on Supply Chain performance. The study also sought to investigate various IT applications used in supply chain operations. The main aim of the study was to enlighten other SMEs to fully implement IT in their supply chain operations as well. A case study was done on an SME firm known as International Energy Technik Limited. Data was collected on a qualitative approach where an interview was conducted with the main people in the supply chain activities. IET is one of the SME's that has fully implemented IT in its operations and has achieved good results. Findings show that IT has improved the processes of transactions across the various functions and also it is integrated in such a way that information flows along the various functions between procurement and planning; logistics and warehouse. The various technologies used have reduced costs of operations in the supply chain and a lot of savings have been achieved. It is also noted that lead time for orders has been reduced. There has been an improved customer service where both internal and external customers are happy in due to faster response from the supply chain. The study recommends that companies especially in the SME sector should implement IT in their supply chain operations to improve efficiencies as indicated in the diagrams.

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## **ABBREVIATIONS**

B2B	Business to Business
B2C	Business to Consumer
C2B	Consumer to Business
C2C	Consumer to Consumer
CCTV	Closed Circuit Television
CRM	Customer Relationship Management
DHL	Deutsche Post
EDI	Electronic Data Interchange
ERP	Entity Resource Enterprise
FMCG	Fast Moving Consumer Goods
FMS	Flexible Manufacturing Companies
GM	General Manager
GPS	Geographical Positioning System
GPRS	Geographical Positioning Reference System
GRN	Goods Received Note
ICT	Information Communication and Technologies
IET	International Energy Technik Ltd
IT	Information Technology
POS	Point Of Sale
RBV	Resource Bases View
RFID	Radio-Frequency Identification Device
RFQ	Request For Quotation
SCM	Supply Chain Management
SMEs	Small and Medium Enterprises
WMS	Warehouse Management System
XML	Extended Markup Language

# **CHAPTER ONE: INTRODUCTION**

## **1.1 Background of the Study**

This section introduces the use of Information Technology in the supply chain activities of the firms that are involved in procurement, logistics and international trade activities like imports and exports. Information Technology (IT) is where an organization uses technology to acquire, store, process and organize data (Rajaraman, 2004). As Graham et.al, (2013) states, IT involves software, hardware, firmware and middleware as well as network infrastructures, platforms, operating systems and the worldwide web.

### **1.1.1 Supply Chain Management**

Gibson and Novack (2008) describe supply chain management as the management of flow of products, services, information and finances from supplier's suppliers through intermediate organizations out to the customer's customers (Gibson and Novack, 2008). Supply chain management encompasses the management of all logistics process of a business. These logistics processes include activities such as procurement, warehousing, inventory control, manufacturing, distribution and sales order of a business (Graham et.al 2013).

In today's world, companies are often seen as parts of multi-company, multi-echelon networks (Karkkainen & Sarpola, 2007). IT is very important in a firm's supply chain activities. The supply chain is a new field in Kenya and many firms are doing international trade. In today's world, the business environment is fast and complex and there must be an efficient and effective supply chain. Firms keep on procuring materials for manufacturing and some to deliver to customers at the right place and the right costs.

In order to improve their operations, companies must find ways of improving their flexibility and responsiveness. This will be done by changing the strategy on operations, methods and technologies that include implementing the supply chain paradigm and IT. In order to manage the supply chain networks, organizations need Information Technologies to manage these networks. There is a need to increase information flows along the supply chain using these technologies. According to Boone and Ganeshan (2007), use of internet and related

technologies has enabled companies to do business with other firms outside their scope as efficiently and effectively as they conduct business within themselves.

Companies use the Information Technology in various ways. IT is usually one of the best ways to cut costs and also improve the performance of the firm. Most large firms use Information Technology to synchronize processes along their supply chain. These processes include upstream procurement, internal production, downstream sales, customer service as well as information sharing along the supply chain. There are various supply chain activities that use IT. These activities include use of the internet to buy and source materials. According to Chopra & Meindl (2001) Intel Company implemented an online ordering application that saw hundreds of clerks being laid off their jobs. With E-business technologies, companies are able to conduct business transactions online. This includes transfer of documents like orders, invoices, and payments. Enterprises Resource systems such as CRM, RFID, Inventory management systems are being used by companies to integrate activates in the supply chain.

Da Silveira and Cagliano (2006) mention that the invention of internet business and business applications has created new innovative opportunities for supply chain management. Organizations in the supply chain use Information Technology for their supply chain activities. The companies use ERP systems such as tally and pastel to integrate activates such as finance, manufacturing, inventory control and purchasing. They also use electronic data interchange to exchange electronic documents such as invoices, RFQs, purchase orders and waybills. There is also use of extranets and internets that allow sharing of information between employees, management, suppliers and customers (Akkermans et al, 2003).

These companies use computerized shipping where they have real time tracking devices to track their shipments. They usually receive notifications such as location, weight and the number of packages when tracking the shipments. They are also able to transmit information between different regions regarding the shipments and their destinations. All these use of IT helps these companies to improve their flexibility and also reduce the costs in the supply chain. British American Tobacco uses Information Technology to integrate manufacturing and supply chain activities (Armstrong and Hagel, 1996).Major Kenyan supermarkets are also using information technologies in their supply chain activities. They use barcode readers

to identify products. They also use electronic point of sale at the cashiers register. There is also use of CCTV cameras to monitor burglars in supermarkets.

### **1.1.2 Supply Chain Performance.**

Supply chain is seen as a part of network that supplies set of products and services from supplier's suppliers to final customers. It is a whole commercial chain that is embedded in the network with a common goal of efficiency and effectiveness (Hertz 2001).

Ackerman (2003) states that performance measurement is seen as an important management task to achieve objectives. According to Hald (2007), supply chain performance is supposed to evaluate the extent to which supply chain itself is currently delivering customer value and outline how it could be improved. Performance in a supply chain is measured in three dimensions which are efficiency, effectiveness and flexibility (Hald, 2007). Efficiency is a cost related advantage while effectiveness is an advantage of customer responsiveness. Efficiency improvements are achieved through Just-in-time production and logistic supplier nets. Effectiveness on the other hand is achieved through customer orientation (Moller and Torronen, 2003). The main aim of an efficient supply chain is to coordinate flow of materials and services so that inventories can be minimized (Li, 2005). The efficiency of manufacturers and service providers within the supply chain is also maximized.

Effective supply chain management requires continuous improvements in both customer service levels and internal operating efficiency of the companies in the supply chain (Hugos, 2011). In order to provide the best customer service, there consistence high order fill rates, delivery rates should be high and on time and the rate of products being returned by customers should be low (Hugos, 2011). When it comes to internal efficiency in the supply chain, the organizations should get an attractive rate of return on their investments in inventory and other assets. They should also find means to lower their operating and sales expenses (Hugos, 2011). Efficiency and effectiveness in a supply chain improves the value of a supply chain. Value is viewed in terms of monetary as well as non-monetary outcome and value creation is a set of direct and indirect relationship function (Walter et.al, 2001). According to Moller and Torronen, 2003, supply chain efficiency has a direct influence on value while supply chain effectiveness has an indirect influence on value.

### **1.1.3 International Energy Technik Ltd**

International Energy Technik Ltd (IET) started out as a subsidiary of British Airways in 1949. IET has developed as strong local team of technical people who offer turnkey solutions to industry at affordable prices and a local presence. The company partners internationally with manufacturers and suppliers. They include companies such as Siemens AG in Germany, Epcos AG, Omicron and Indian suppliers. The company has also started getting products from new markets in Turkey, Spain and The Netherlands. IET has carved itself in a niche in the sale of electrical switch gear, execution of Low voltage and Automation systems training as well as in Automation training ([www.iet.co.ke](http://www.iet.co.ke))

IET has been manufacturing type tested low voltage switchboards under license from Siemens AG under their trusted brand name SIVACON. IET has a large stock of electrical products that are bought from international suppliers. The company participates a lot in the international supply chain. Raw materials, goods and services have to be bought from international suppliers and the process of logistics has to be completed. This involves sourcing for quotation, sending purchase orders, organizing for the dispatch and delivery of goods and also engaging suppliers to ensure timely delivery of goods ([www.iet.co.ke](http://www.iet.co.ke)).

Information also flows between IET and the international suppliers. There is a lot of exchange of documents like invoices, orders, waybills, shipping documents. There is also exchange of emails and correspondences in order to know status of goods, push for delivery and also coordinating the movements of goods from the country of supply to the Nairobi airport or Mombasa port. The company also has a GPS system to track the shipments that are out for delivery. In addition, the stores and workshops have systems that monitor the flow of inventory that goes in or that leaves the premises. The company has Oracle ERP for running the whole supply chain. The company also has online systems that are used to generate documents like orders, import declaration forms among other import documents needed for clearing. The procurement and logistics personnel use systems such as Simba and Orbus to process clearing documentations for the shipments coming from international suppliers. They also use SAP system to book orders online, process and check their status (Graham et.al, 2013).

This paper will investigate how information technology has improved the management of supply chain activities in Kenyan companies. The subject company is International Energy

Technik Ltd. IET was a case study as it does imports, logistics and freighting as its main core business. It has a whole supply chain paradigm of warehousing, procurement, logistics and planning. IET has managed to be paperless in its core supply chain operations and this is why it was selected for this study.

## **1.2 Statement of the problem**

Companies are striving to maintain relationships with global suppliers. IT is being used to address the information needs of supply chain is by companies (Lan & Unkhelkar, 2006) and the customer's demands have increased. Organizations are reexamining how to conduct business due to new technologies and the increasing intensity of competition (Graham et.al, 2013). Thus, companies are reinventing their supply chains in order to succeed and meet the new customer driven challenges. This is in order to maintain a competitive edge by attracting more customers and defending against the competitive forces (Graham et.al, 2013). Reducing the inventory cost is a major advantage and companies are seeking ways to please customer demand for fast and efficient service. Companies are seeking ways of managing the entire supply chain from raw materials to delivery of finished products to the customer.

Information Technology has a very big impact on the supply chain. We have seen that E-commerce is one of the IT that has contributed a lot to improvement of the supply chain. It is an important aspect of cutting costs and a great enabler of the supply chain (Hill, 1999). Small and medium firms in Kenya that have manual systems in their supply chain activities incur a lot of costs. The main problem of a manual system is the time spent in searching records, data redundancy, insufficient security backups and no updated records. This hinders the performance of the firms in their supply chain activities. IT will save the firms in reducing these problems and they will be able to focus on getting new markets for their products, sourcing new suppliers, responding faster to customer demands and gain a competitive edge in the market. IET is a small and medium firm (SME) that has an automated supply chain. There is a gap between SME's that are using a manual supply chain and the ones that use Information Technologies in their supply chain activities (Austin & Nolan, 1999).

There is lack of research in Kenya regarding the use of Information Technology in supply chain activities among the SME's. IT plays a critical role in a firm's supply chain because of

the information that flows along the supply chain. For companies to achieve a competitive edge, they must maximize the use of Information Technology. This will enable organizations to come up with ways of reducing inventory cost, improving the lead time for products and integrate supply chain with the various functions of an organization (Austin & Nolan, 1999). Managers need to be up to date on information such as inventory, customer demand and supply lead time. All this information flows at the different stages of supply chain (Shah, 2009). Supply chain managers need to have information on customer demand, supplier availability, inventory level, delivery, shipping locations and routes and also costs and margins. Gibson&Novak (2008) have noted that companies today are putting more efforts on Information Technology in order to become more innovative, attain a competitive edge and adapt to the fast and complex environment. The invention of Information Technology in the world has increased the demand of customers.

### **1.3 Objectives of the Study**

1. To determine the benefits of IT in organizations.
2. To establish the various IT applications used in the organization and how they have been deployed in the company for it to maintain its competitive position.
3. To determine how IT has contributed to efficiency and effectiveness of a supply chain

### **1.4 Value of the Study**

This study will benefit the professionals in the supply chain. This is because they will be able to appreciate the value that Information Technology has on the Supply Chain and how they can improve their services in the supply chain in order to attain a competitive edge. Small and medium firms that practice supply chain in their daily activities will also benefit from the study. It is noted that most of these firms do not have improved Information Technology systems that help them improve the activities. It will also be beneficial to retail supermarkets as it will assist them in giving more attention to information technology on their supply chain so as to improve efficiency and effectiveness in their operations.

Academicians will also benefit from the study. They need to put more emphasis on the importance of Information Technology in the supply chain field. Organizations are gearing towards green supply chain where they are reducing waste generated by the supply chain. They need to educate on how IT can reduce paperwork and encourage paperless transactions.

Previous studies have shown that information technology is being used by firms for intergrated supply chain management. This integration leads to better efficiency and effectiveness (Lan &Unhelkar, 2008)



## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

This chapter presents an empirical literature, a brief description of IT applications in supply chain management, description of supply chain performance, benefits of IT to supply chain management. This chapter will also present the empirical studies done on IT in supply chain management. The purpose of literature review is to enable the researcher understand the research done on IT.

### **2.2 Functions of Information Technology**

Shah (2009), notes that IT in an organization has various functions. IT increases scale efficiencies of the firms operations, processes basic business transactions, collects and provides information relevant to managerial decisions and also maintain records of status and change in the fundamental business functions within the organization and maintaining communication channels. Such functionalities are also expected in a supply chain. IT links can connect all the processes of a supply chain into an intergrated and coordinated system that is fast, responsive flexible and able to produce a high volume of customized products at low costs (Shah, 2009)

Companies are always in the race of improving their organizational competitiveness. Organizations nowadays are faced with a lot of challenges in their supply chain. This is due to the increase in construction scale and the cost of purchasing equipment, storage, maintenance and supply are one of the challenges that organizations face (Liu, 2011). Organizations in the 21<sup>st</sup> century view supply chain management as a global organization strategy for achieving organizations competence (Vickery et al., 2003). In order to improve their flexibility and responsiveness, companies are changing the way they operate by implementing Supply chain management paradigm and Information Technology (Vickery et al., 2003). The market nowadays is electronically connected and dynamic in nature.

### **2.3 Information Technology Applications in Supply Chain Management.**

Information Technology helps to assess structure of the supply chain companies, the nature and management of supply chain and the environment in which the businesses operate from. The SME firms have the potential to improve their Information Technologies so at to lower

the costs associated in the supply chain. The companies have effective Information systems that lead to efficiency and effectiveness of the supply chain. However, the management feels that it is not enough and the targeted number of costs have not yet been reduced as desired (Ackermann et al., 2003). Organization's management need to assess the structure, nature and management of the supply chain by using tools and techniques of IT to measure cost and performance.

### **2.3.1 Warehouse Management Systems**

Warehouse management systems carry out functions such as planning commands and running day to day operations of a warehouse. This system covers areas such as receipt of goods, allocation of storage locations, and inventory replenishment of picking locations, generation of picking lists, order picking and issue of goods. These systems also keep track of inventory in warehouses (Graham et.al, 2013)

### **2.3.2 ICT, EDI, WWW**

Development of Information Communication Technologies (ICT) like electronic data interchange (EDI), the internet and World Wide Web (WWW) has improved the concepts of supply chain design and management paradigm. These technologies have been developed to prevail over the demanding complexity of the systems that drive the relationship between buyers and suppliers. Watson et al., (1998) state that the internet improves the communication rapport between the organization and the customer. The internet on the other hand is used to build supply chains that are commercially workable in order to meet the setbacks that are present in the virtual enterprises (Philip and Pedersen, 1997). Organizations are doing businesses online and this is a sign of evolution in the business communities (Armstrong and Hagel, 1996). Use of EDI technology in the supply chain facilitates sharing of information along the chain. This enables reduction in uncertainty and also improves shipment performance of suppliers thus leading to an improvement in supply chain performance (Srinivasan et al., 1994)

### **2.3.3 Enterprise Resource Planning Systems**

One of the IT applications being used by organizations is the Enterprise Resource planning Systems (ERP). ERP system is an enterprise management model which is modern. It is based on computer aided information management system. ERP system makes supply chain activities be a network system by using the modern information technology. Activities such

as logistics, capital flow, and information flow are effectively integrated to achieve the target of optimal allocation and sharing of capital resources (Xiaohui, 2012). ERP is a comprehensive transaction management system that combines many kinds of information processing abilities and places data into a single database (Ackermans et al, 2003). ERP can also be defined as an intergrated business software system that powers a corporate information structure, controlling a broad range of activities from the procurement of supplies to shop floor control and financial accounting. (Ackermans et al, 2003). ERP system enables an organization to efficiently and effectively manage the use of resources such as materials, human resources and finance by providing a total integrated solution for the organizations information processing needs (Wang and Nah, 2001). E-business and supply chain management are the two frontiers of the ERP. When supply chain applications are linked with other business systems, users can slash cycle times and reduce inventory. The users also reach beyond their own corporate walls to connect better with suppliers, distributors and customers to engage in e-business (Wang and Nah, 2001)

#### **2.3.4 Radio Frequency Identification**

Radio Frequency Identification (RFID) is an IT technology that is used in manufacturing, logistics, supply chain management and inventory control. They are used for automatic object identification. The RFID systems have radio frequency tags that are used for transmitting resident data; the tags have a unique serial number for identify each product. The data transmitted in the RFID can be read automatically. RFID tools are very common among airports, shipping companies, transporters and manufacturing firms that have high value items. RFID assists in providing operational efficiencies and improved stock level transparency in short shelf-life products distribution (d'Hont and Frieden, 2000). RFID also assists in managing cargo that travel by air. Freighters are able to know where their cargo is due to the tags attached to the pallets and containers and a logistic manager can easily monitor and control cargo movement. There is also less delay and avoidance of misplacing items thus providing efficient and high quality service (d'Hont and Frieden, 2000).

#### **2.3.5 Flexible Manufacturing Systems**

Technologies such as Flexible manufacturing systems (FMS), group technology and computer integrated manufacturing help to improve flexibility in the supply chain. The internet facilitated transfer of information and communication thus facilitating quick response of control systems. Flexibility of these systems leads to customer loyalty. One example is the

Toyota Company that uses FMS in order to respond to customer demand (Bower and Hout, 1988)

### **2.3.6 E-Commerce**

E-commerce is an IT application that is used by many businesses in their supply chain operations. The increase in popularity is brought about by the operational benefits that they bring to the purchasing practices. E-commerce has brought about cost savings in a business. There is less paper transactions, the order cycle time is short. The speedy transactions of purchase orders have led to subsequent inventory reduction and there is also improved partnership between buyers and suppliers through the introduction of website of business to business communication networks. With E-commerce, organizations are also known to reach new markets and segments and also improve their core processes (McIvor et al., 2000). Supply chains adapt well to the fast changing Internet commerce environment. This is because organizations are able to enter and evolve more quickly than the traditional ones.

Relations created by E-commerce include business to business (B2B), business to consumer (B2C), consumer to business (C2B) and consumer to consumer (C2C). This maintenance and creation of relationship enables the firms to succeed in their operations. These systems enable communicate benefits of relationships to firms, clarify customer needs and expiations, improve performance measures with suppliers and also create competitive advantage (Stuart and McCutcheon, 2000; Lester, 2000; Vokurka, 1998).Fast-Moving Consumer Goods sector has a collaboration movement known as Efficient Customer Response Movement that has multiple technological and managerial innovations. This movement aims to transform retailers, distributors and manufacturers into a more efficient inter-linked organization (JIPOECR, 1995).

### **2.3.7 Point of Sale Tracking System**

The Point of sale tracking system is also another application used in supply chain management. It is known as a customer facing IT application (Shah, 2009) where the scanning system and the retailer's inventory management systems are connected. The goods are usually marked with a bar code and are scanned by a reader that recognizes the goods. The POS provides an instant record of transaction because the items are noted, tallied and a transaction is recorded. Shah (2009) notes that replenishment of products can be coordinated in real time to ensure that stock outs in the retail store are avoided.

### **2.3.8 Decision Support Systems**

Decision Support systems covers various levels of decision making in supply chain management. These levels include strategic, tactical and operational levels of supply chain management (Shah, 2009). According to Gibson and Novack (2008), the different levels have different information needs; operational decisions where decisions on how to fulfill a customer's order, tactical decisions entailing how to stock a particular product and strategic decisions where on warehouse locations and products to develop.

### **2.4 Supply Chain Network**

The supply chain network supports three types of flows that require careful planning and close co-ordination. One type of flow is the material flow that represents physical product flows from suppliers to customers as well as reverse flows for product returns, recycling and servicing. Information flow involves order transmissions and order tracking which coordinate physical flows and financial flows which represent credit terms, payment schedules and consignment and title ownership arrangements (Austin and Nolan, 1999). The network is supported by three pillars; Processes, which encompasses logistics, new product development and knowledge management; organizational structures which encompasses a range of relationships from total vertical integration to networked companies and enabling technologies is another pillar which encompasses both process technologies and information technologies.

### **2.5 Supply Chain Performance**

Supply chains perform two principal functions. One is the physical function of transformation, storage and transportation and the other function is the market mediation function of matching demand and supply. Efficiency is an internal standard of performance. Effectiveness on the other hand is an external standard to fit to various groups demands (Pfeffer and Salancik 1978). It is through performance measurements that companies achieve their objectives (Ackermann, 2003). Performance in a supply chain is measured by efficiency, effectiveness and flexibility (Hald, 2007). Supply chain efficiency focus on Cost reduction, reduced inventory, shortened lead-time and streamlining supply chain process.

Most organizations focus on cost reduction in the supply chain while improving the lead-time. Supply chain effectiveness focus on improved customer service, increased market share, and increased sales, new product development. As Ramdas and Spekman (2000) put it,

reduced inventory means that the inventory levels are maintained, there is time to market and break even. Order fulfillment should capture the extent to which a supply chain partner affects order processing time and shipment accuracy (Ramdas and Spekman, 2000).

The supply chain field has transformed over the past years where suppliers and customers are linked inextricably from the time raw materials are delivered from source through the different value adding activities to the ultimate customer. Spekman et al, (1994) states that competition is evaluated as a network of cooperating companies that compete with other firms along the supply chain. Companies are now accelerating their efforts to align process and information flows through the entire value added network so as to meet the increasing expectations of a demanding market place (Quinn, 1993). Companies measure their success in terms of cost, speed, innovation and customer satisfaction. According to Michael Porter (1985) the prime source of competitive advantage is the coordination of complex global networks of a company.

Brewer and Speh (2000) state that a successful supply chain will effectively coordinate their processes, focus on delivering customer value, eliminate unnecessary costs in key functional areas and create performance measure systems that provide data on whether the supply chain is performing to expectations. In order for companies to gain a competitive edge over their competitors in the global supply chain, the firms must provide the high quality products to its customers (De Meyer et al.,1999), at low cost (Goonatilake, 1990), with short lead times (Hugh, 1985)

In terms of cost reduction, firms are seeking to reduce waste along the supply chain by minimizing duplication, harmonizing operations and systems and enhancing quality (Brewer and Speh, 2000). There is maintenance of inventory in order to avoid duplication by centralizing the level of inventory. Most organizations are planning the inventory level by analyzing customer demands. The firms are doing an analysis of the customer order patterns. Organizations are also integrating their systems in order to reduce wastes. When organizations reduce costs in their operations, the firm is at better place of selling their products at a lower price than that of their competitors. This is mostly for price sensitive goods (Fisher, 1997).

Improving lead time for orders and reducing uncertainty is another supply chain efficiency measure. Improvement in lead time leads to reduced inventory in the organization (Brewer and Speh, 2000). There is also improved cash flow as customers are able to pay for the goods delivered on time leading to enhanced cash flow and financial performance in the system. Reducing delivery time also leads to smooth flow of information and products along the supply chain. This flow also enables the parties to respond quickly to customer demands in a timely manner. Improved lead time is achieved by streamlining supply chain systems (Fisher, 1997). This creates consistency in product quality and also ensures reliable supply.

According to Stewart (1995) the driver of customer satisfaction is that link in the supply chain that deals with customers in delivery of goods and services. Effective customer service occurs when the supply chain delivers the right products at the right time and place to the customers. Improved customer service can also be achieved in developing partnership with the customers and also maintaining these relationships. Supply chain metrics must be linked to customer satisfaction so as to ensure effective performance in the supply chain. In order to achieve customer satisfaction, products and services must be made available to meet the individual demand of customers.

## **2.5 Benefits of IT to Supply chain management**

The modern information and communication technologies (ICT) make it possible to develop and implement a variety of flexible supply chain design options that can create significant cost and value advantages (Christiaanse & Kumar, 1999). Information systems like ERP systems have integrated the information embedded in functional business processes. Companies like Cisco reported savings of 500 million dollars when it restructured its internal operations and integrated processes with suppliers and customers with the help of web-based tools (Berger, 2000). 90 percent of Cisco's sales are facilitated online (Copacino and Dik, 2001).

Information Technology helps companies respond fast to customer demand thus improving customer service in the company. For example, Celestica Company one of the world manufacturers in electronics has applied a web-based solution to better co-ordinate its global supply base (Shore, 2001).

IT changes industry structures and rules of competition, creating competitive advantage and creating new business opportunities (Porter and Millar, 1985). In terms of supply chain, IT is the key to supporting companies creating strategic advantage by enabling centralized strategic planning with day to day centralized opportunities. Williams et al (2002) argues that electronic supply chain management combines the structural benefits of SCM with the efficiency benefits of an arm's length approach enabling lower costs. IT in supply chain management also provides a reduction in cycle time, reduction in inventories, minimization of bullwhip effect and improvements in the effectiveness of distribution channels (Levary, 2000)

Successful companies have developed focused e-business solutions for improving customer service elements that are success factors in their business operations. EDI for example contributes positively to order cycle time, product availability, distribution malfunctions, product availability, and distribution flexibility among other things (Lim and Palvia, 2001).. Information Technology has enabled companies to streamline logistics flows, reduce inventory and improving customer service thus improving efficiency in information transfer. The use of internet has made it easier to share information along the supply chain. This has led to improved operational performance, good customer service and solution development (Graham et.al, 2013). Supply chain relationships and collaborations have also evolved as a result of information technology and the information sharing along the supply chain. A good case is seen in the industries that deal with Fast Moving Consumer Goods (FCMG). The collaboration has been articulated through the efficient Consumer Response Movement (Graham et.al. 2013).

Vendor-Managed Inventory has enabled sharing of information between buyer and seller. Buyers are able to share their information on demand to their supplier. The supplier in turn manages this information and can be able to do forecasting based on the data received. This is mostly seen in supermarkets (Graham et.al, 2013). This data is also transmitted from warehouse inventory reports and orders information.

IT enables a firm to keep costs down. In the fast changing world, organizations must be innovative, offer new service packages and organizational linkages with the customer. In order to do this, there must be a discipline of change which encourages innovation and yet retains the stability of existing procedures until innovations are ready for wide spread



adoptions. This is the work of IT. Large firms are also using IT to communicate with customers on order status and also manage outsourcing of customer service functions (Tippins & Sohi, 2003).

Order track and trace allows organizations to have smooth and accurate information about order status. This is especially useful where organizations have multiple tiers of suppliers, inventory locations and plants. Order status also enables customers to enquire about their order status regardless of their locations (Shah, 2009)

Shah (2009) noted that IT is also useful in supply chain decision support. Transaction system captures data on orders, stock, shipments among others. There is collaboration and coordinated system that ensures all supply chain data is available in a timely manner to all entities in a supply chain. Decision Support Systems (DSS) use the data captured to create feasible and economical plans dealing with different stages of the supply chain. The management is able to answer important questions as what should be produced, when and where (Shah, 2009).

## **2.6 Empirical Literature**

There are two streams of empirical studies that have been done on the use of IT in supply chain management. One of the stream focuses on a specific technology and the second stream studies the applications and benefits of IT in general. Authors such as Iacovou et al.,(1995), Mukhopadhyay et al (1995), Tuunainen (1998) focus on adoption factors and impact of Electronic Data Interchange (EDI). Mukhopadhy et al., (1995) has identified cost reduction as an objective of EDI links while Tuunainen (1998) links EDI with the volume of transactions between supply chain partners. Nurmilaakso et al., (2002) studied the use of Extended Markup Language (XML) for supply chain intergration. Research focusing on application areas such as the tracking systems and their efficient coordination on the logistics flows have been widely conducted by authors such as Harris, (1999), Stefanson and Tilanus(2001) among others. As much as these tracking systems have not been empirically founded, there is a wide use of tracking systems and tracking information in many logistics companies.

Zhu and Kraemer (2005) developed a resource based view (RBV) framework to assess IT enabled resources at both the front end and the back end. The RBV was drawn primarily from

the value of IT in digitally enabled supply chains. Barney (1991) & Peteraf (1993) attribute RBV to improvement in the performance of the firm to valuable resources or resource bundles. The IT value creation was looked from one lens where IT value creation has a direct role for IT in firm performance. The main reason is that IT affects other resources that lead to competitive advantage. IT was seen as an independent variable while the other variables like revenue generation and cost reduction are viewed from the other lens as dependent variables. According to Mukhopadhyay and Kekre (2002), revenue and cost reduction are the two major dimensions of process performance improvements through supply chain integration.

Gunasekaran and Ngai (2004), state that a comprehensive study of IT in supply chain will be useful to identify critical success factors of IT for an integrated supply chain. There has not been adequate attention from researchers and practitioners in the design and implementation of the supply chain management especially in the business to business ecommerce and the supply chain (Gunasekaran and Ngai, 2004).

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

In this chapter, the researcher describes the general methodology applied in carrying out the research project. It will describe the data collection procedures and the tools used in obtaining data used in this research; the process of data analysis, the study design, the target population and size, together with the sampling technique was used in the research.

### **3.2 Research Design**

The study covers the impact of Information Technology on the performance of supply chain management at International Energy Technik Ltd. A case study research design was conducted at IET because the company has a strong ICT that has enabled it to be paperless in its operations achieving a competitive edge in the engineering field in Kenya. It is also an SME adopting the use of Information Technology in its supply chain activities.

Robson (2008) defines a case study as a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence. Morris and Wood (1991) add that a case study is relevant for a researcher to gain a rich understanding of the context of the research and the processes being enacted. Case studies have the ability to generate questions such as “what”, “how” as well as ‘why’ and they are very good at exploring existing theory. Case study can also enable a researcher to provide a source for new hypothesis.

### **3.3 Data Collection**

This study used primary data which was collected on a qualitative approach. The data was collected from the respondents using open-ended interviews. The research was conducted at the IET premises along Mombasa road. Five respondents were interviewed and they included the General Manager, warehouse manager, sales and planning manager, procurement officer and the logistics manager. Interviews were conducted on a one to one basis (Haeley & Rawlinson, 1994). All the respondents were present.

There was a conversation between the researcher and the respondents. Questions were asked to elicit facts and statements. The main goal of the interview was to gain a subjective understanding of what the respondent were saying. It was exploratory in nature (Saunders, 2009). Respondent interviews were used where the interviewee responded to the questions of the researcher. The interview forma was not limited to structured interview as at times the interviewee will be given the opportunity to talk freely about events, behavior in relation to the topic (Saunders, 2009)

Data reliability refers to the extent to which your data collection techniques or analysis procedures yielded consistent findings (Saunders, 2009). This was a challenge in my study to ensure that my data collection and analysis was not biased (subject or observer biases) and erroneous.

### **3.4 Data Analysis**

The data collected and used was qualitative in nature. There was use of descriptive analysis which included quantitative and qualitative methods to come up with in-depth informative of the study. Words, contexts, consistency are the variables that were used when analyzing the data. The frequency of comments and content analysis was used. Thematic analysis was used where important moments within the raw data will be recognized and encoded before the interpretation. In thematic analysis, the researcher used a coding process where important moments were recognized and encoded prior to the process of interpretation (Tesch, 1990). The researcher has used a good code that captures the qualitative richness of the phenomenon. Encoding the information organizes the data to identify and develop themes from them (Boyatzis, 1998). Some graphs have also been provided to show the progress the company since IT was fully implemented in the company.

## **CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND DISCUSSION**

### **4.1 Introduction**

This chapter provides a summary of the data analysis, results of the study and the discussion of the results of the study. The chapter is organized as follows: section 4.2 describes the data presentation, analysis and the results of the study and section 4.3 discusses the presentation of findings of the study with regard to the objective of the study which was to determine the benefits of IT and the various IT applications used in supply chain activities.

### **4.2 Data Presentation and Analysis of the Result**

The data was obtained from staff of the different supply chain functions. The General Manager, Warehouse Manager, Procurement Officer, Sales and Planning Manager and the Logistics Manager. The data was analysed on a thematic and content approach. Data given by the company was based on the last four years since they completed adopted.

#### **4.2.1 View of Information Technology and Supply chain from the General Manager's Point of view**

IT plays a critical role in a firm's supply chain because of the information that flows along the supply chain. For companies to achieve a competitive edge, they must maximize the use of Information Technology. This will enable organizations to come up with ways of reducing inventory cost, improving the lead time for products and integrate supply chain with the various functions of an organization.

Managers need to be up to date on information such as inventory, customer demand and supply lead time. All this information flows at the different stages of supply chain. Supply chain managers need to have information on customer demand, supplier availability, inventory level, delivery, shipping locations and routes and also costs and margins. It has been noted that companies today are putting more efforts on Information Technology in order to become more innovative, attain a competitive edge and adapt to the fast and complex environment. The invention of Information Technology in the world has increased the demand of customers. The company has adopted the use of ERP and supply chain

management systems in the organization. One of the ERP systems is the WMS that is integrated across all functions of supply chain. This has generated more revenues from value added service operations and capture of labour and costs associated with work orders.

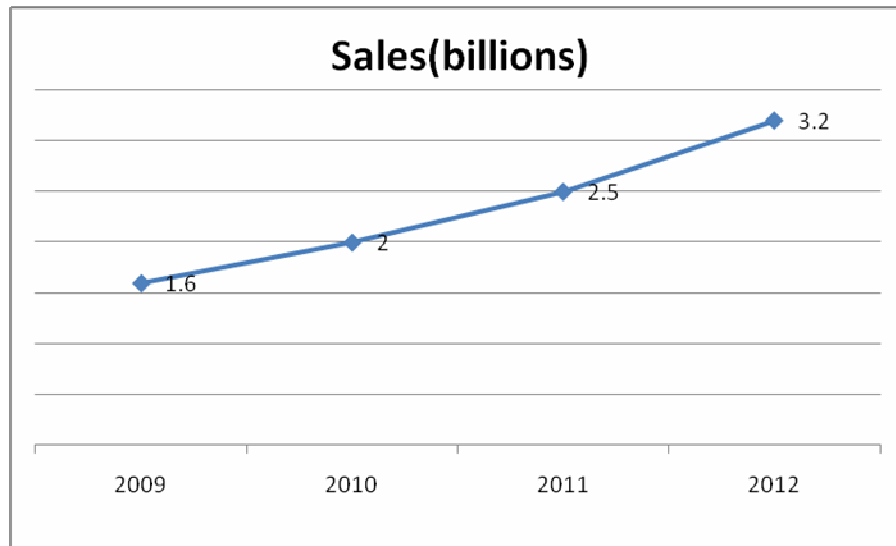
The manager also observed that since the company started using IT, of the inventory has reduced.

He quoted the following “There was theft within the company due to lack of audit trails in the system. The company has expanded into neighboring countries and the procurement process is centralized making it hard to keep record is of purchase orders, invoices and track a requisition once raised. So IT was introduced in the company to simplify the procurement process. Once a requisition is raised, and a purchase is done, the warehouse or the stores people are able to create a Goods Received notes automatically in the oracle system instead of printing out a manual GRN and filing it. This automation has improved efficiency in operations; it is much easier to close out a Purchase order and forward it to finance for payment.” “ IT has changed the role and type of relationships between us and various players, creating new value networks and developing new business models. We needed to choose a coordination mechanism in order to fill critical information gaps and serious challenges for supply chain managers, including misinformation and ultimately, mistrust.

In this view, IT is a key factor that has enabled for competitive advantage, by cementing relationships with our customers, enabling integration forward or backwards in the industry value chain, and establishing a technological lead.”

This is in comparison with literature review where it is stated that companies are always in the race of improving their competitiveness. Vickery et al.,(2003) states that organizations in the 21<sup>st</sup> century view supply chain management as a global organization strategy for achieving organizations competence. The manager has stated very carefully that IT plays a very critical role in the firm’s supply chain as it has helped the company maintain its competitive edge. This is also shown by sales revenues of the company that have increased from Kshs 1.6 billion in 2009 to 3.2 billion in 2012 as shown in the diagram below:

**FIGURE 1: SALES REVENUE OVER THE PAST FOUR YEARS**



Source: IET's database

#### **4.2.2 Sales and Planning Function:**

IT is used in supply chain to manage supply and demand. As the manager put it, IT manages Demand by; Capturing all the end user requirements and consolidate their demands and needs, Preparation of records required to provide future forecast of demand verses trend and Consumption reports through transaction in the system that provide information on consumption trends on use of products

Consolidating demand ensures that there is; Competitive pricing, cheap transport/shipping costs, Handling and clearing and also contracted supplier's regular identified requirements.

IT on the other hand manages supply by capturing all information in the database on suppliers and deliveries, recording of previous suppliers used to forecast supplies, approval of purchase orders, managing suppliers by vetting them and blacklisting of suppliers through evaluation. Supplier details such as lead times, cost of production, shipping time, cost and point of sourcing are also determined.

Avoiding stock outs and stock overruns is done by; Setting up of stock parameters in the systems, Provision of alerts on different levels of current stocks, Regular reports; daily, weekly and monthly and email correspondence with internal and external customers

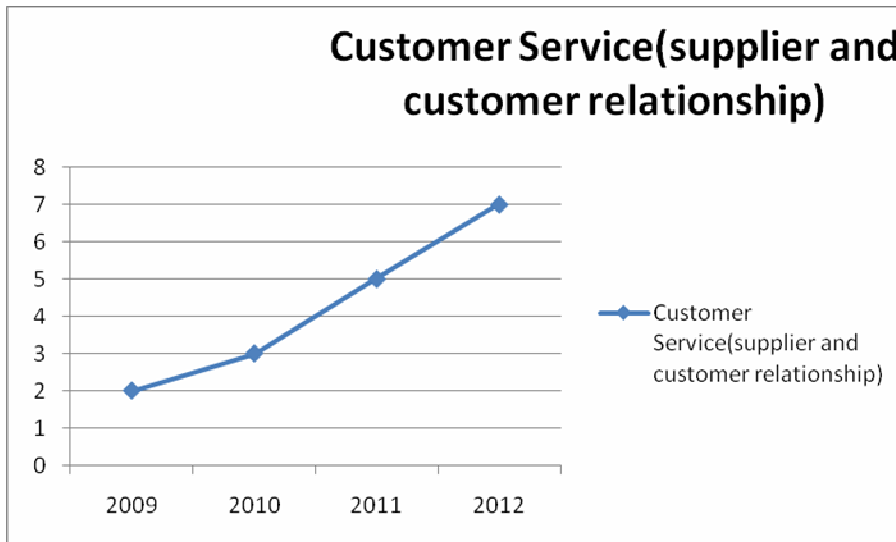
Since the invention of IT, the level of customer service has improved. This is because planning and marketing triggers buying through need identification gathered from the different users, departments, memos, minutes, proposals and projects. The needs are then approved in the database through the approval hierarchy. Items in the Oracle system are captured and coding, setup parameters and lead times are determined. The initial buying is triggered when a PDI is raised. The level of responsiveness from both internal and external customers has increased. WMS has been intergrated for both planning and warehouse functions thus is possible to create and manage work orders across facilities to satisfy customers unique fulfillment requests based on demand or to stock in anticipation of demand.

One of the elements in the literature review is the benefit of IT to supply chain management. It is stated that successful companies have developed focused e-business solutions for improving customer service elements such as product availability, distribution flexibility and order cycle time. As shown in the sales function, the sales and planning manager has emphasized very clearly how IT is used to manage demand and supply in the company by capturing end user requirements and capturing their needs and requirement. The end user is the customer and the sales and marketing people.

Customer service for both suppliers and Customers increased from a scale of 2 to a scale of 7 in 2012. This is shown in the diagram below.



**FIGURE 2: CUSTOMER SERVICE IMPROVEMENT**



Source: IET Database

On a scale of 1-10, you can see that customer service has increased over time.

#### **4.2.3 Warehouse function**

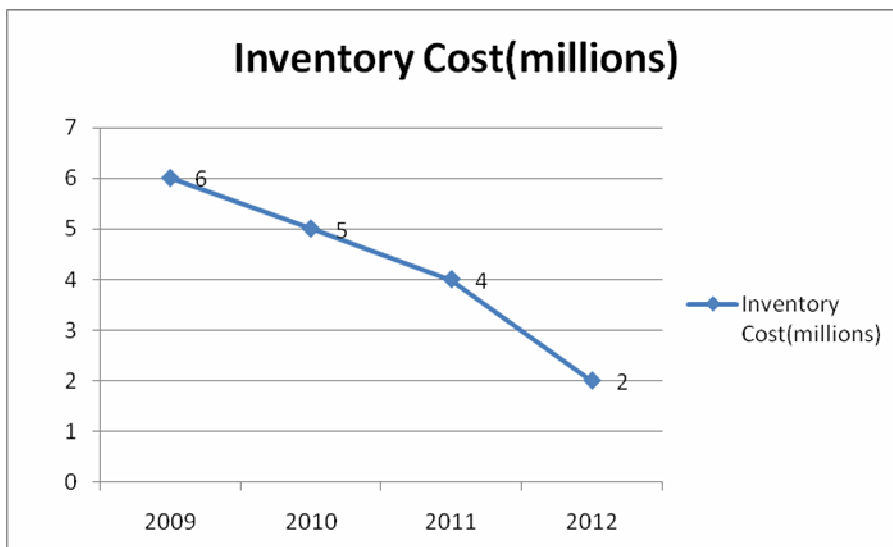
According to the warehouse manager, IT is one of the technologies used to manage the warehouse operations in the organization. One of the warehouse management systems is the ERP system that is used. One of the advantages of the WMS is to enable a user to manage inbound receiving processes where the user gains through global visibility into the company's inbound shipments and track received inventories against Pos, advanced shipment notifications and blind receipts. The manager also noted that it is easier to manage and allocate inventory across the different warehouse locations. WMS has enabled advanced capabilities such as activity tracking and consigned inventory in all selected warehouses within the network. Some of the benefits from the use of WMS include; establishment and measure of labour standards and performance, provision of condition based processing for returns management. There is better inventory accuracy within the cycle due to tracking. This has reduced inventory because the system can communicate to the users on items that are not available and also those that are running out of stock. Through this, users are able to plan on stocking.

In the literature review, the Point of sale tracking system is mentioned as another application used in supply chain management. It is known as a customer facing IT application (Shah, 2009) where the scanning system and the retailer's inventory management systems are

connected. The goods are usually marked with a bar code and are scanned by a reader that recognizes the goods. The POS provides an instant record of transaction because the items are noted, tallied and a transaction is recorded. Shah (2009) notes that replenishment of products can be coordinated in real time to ensure that stock outs in the retail store are avoided.

The diagram below shows how inventory cost has reduced over the past four years.

**FIGURE 3: INVENTORY COSTS**



Source: IET database

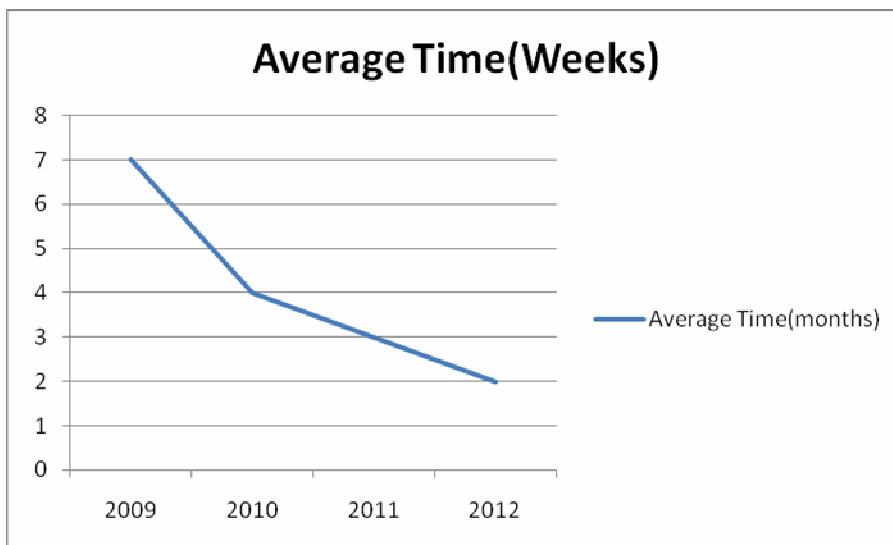
#### **4.2.4 Procurement Function**

Procurement is one of the important functions in the supply chain because it is the procurement officer who has the right and mandate to communicate with the supplier. The officer has to source, procure and ensure through finance department that the supplier is paid. One of the systems used by the procurement is the oracle system where the purchase orders are auto created in the system after the generation of PDI. All the documents such as quotations and proforma invoices are attached in the oracle system. According the procurement officer, an analysis has to be done through excel sheets where prices from different suppliers are analyzed and the cheapest vendor is chosen. Once the POs are created in the system, they are forwarded to the procurement manager who does a due diligence and

approves the purchase order then it is automatically forwarded to the supplier. Suppliers such as Siemens have their own system where once the PDI states that the supplier is Siemens, the officer logs to the Siemens mall and creates a Purchase order that is submitted directly to the Siemens team and a reference number for the order is forwarded automatically to the users email.

One of the benefits gained is that time taken to complete a transaction has reduced greatly with the use of IT in procurement as opposed to manual. This is shown in the diagram below. The maximum time it can take to complete a PO transaction is two weeks; these are mostly purchases that are high risks and need directors' approvals

**FIGURE 4: AVERAGE TIME OF TRANSCATIONS**

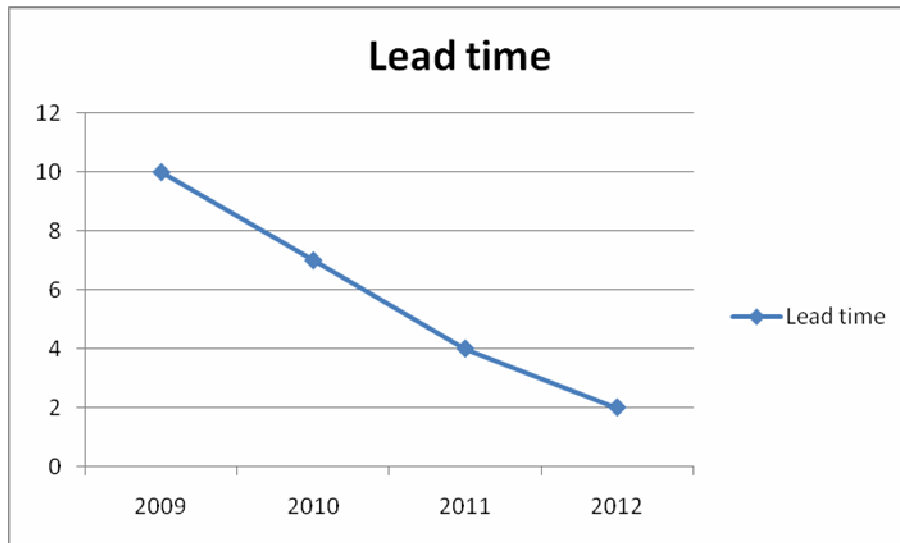


Source: IET database

In the literature review, it was observed that most organizations focus on cost reduction in the supply chain while improving the lead-time. Supply chain effectiveness focus on improved customer service, increased market share, and increased sales, new product development. As Ramdas and Spekman (2000) put it, reduced inventory means that the inventory levels are maintained, there is time to market and break even. Order fulfillment should capture the extent to which a supply chain partner affects order processing time and shipment accuracy (Ramdas and Spekman, 2000)

Lead time has also improved as shown in the diagram below:

**FIGURE 5: LEAD TIME IN WEEKS**



Source: IET database

#### **4.2.5 Logistics Function:**

The logistics team usually picks up the process of logistics after procurement have confirmed that the goods are ready for pickup. When the goods are ready for pickup, or after production, the supplier gives a notification via email correspondence. At times there is an automatic message from the supplier's website. Then through that the transport agents are notified and they collect goods from the supplier. Then goods are given some identification tags and shipment references so that they can be tracked from the system. A waybill number is assigned to the goods being transported by air or courier while a bill of lading is given to the ones being transported by sea. These numbers help to track the location of goods and also plan on how to clear and deliver them to the stores or to the customer's site.

The logistics team track shipments to gather detailed information about a specific shipment while it is in transit. They are able to check on the status of a shipment and its routing information. When they track shipments, there is better control of the entire shipping process. Through the shipment tracking function, the team can locate shipments according to the carrier that is transporting the shipment. Additionally, carriers can provide tracking information through the internet, telephone, or some other means. It is possible to track shipments to know exactly where the shipments are, both physically and within the system.

This information enables the team to report on the product as it travels to customers. Technologies used to track the cargo that is enroute from suppliers place include; GPS and GPRS, RFID, E-commerce such as waybills, bill of lading, and dispatch notes

The supply chain network that is mentioned earlier in the literature review supports three types of flows that require careful planning and close co-ordination which is essential in logistics. One type of flow is the material flow that represents physical product flows from suppliers to customers as well as reverse flows for product returns, recycling and servicing. Information flow involves order transmissions and order tracking which coordinate physical flows and financial flows which represent credit terms, payment schedules and consignment and title ownership arrangements (Austin and Nolan, 1999). The network is supported by three pillars; Processes, which encompasses logistics, new product development and knowledge management; organizational structures which encompasses a range of relationships from total vertical integration to networked companies and enabling technologies is another pillar which encompasses both process technologies and information technologies.

The Oracle system usually integrates the procurement side and the logistics such that a logistics officer will be able to log into the system and view what a certain buyer has purchased and the supplier from which the buyer is getting the materials from. From then the logistics officer will be able to determine the lead of the items, whether they require taxes and start alerting finance on the amount to pay. This advance payment increases efficiency.

### **4.3 Discussion**

Figure one shows the increase in sales and revenue after the IT systems were implemented in the company. This shows how IT has increased revenues for the past four years. Figure two shows the increase in customer service which is a good indicator of supply chain performance and thus leading to increase in customer responsiveness and relationships with the suppliers. As shown in figure three, inventory cost has also reduced in the past years, this is an indicator of how the company has managed to improve its operations thus becoming more efficient. Figure four has also shown how transactions are now conducted faster through the use of IT thus increasing efficiency in the organization. Lead-time has improved through the use of IT as well. Another objective of the research was to determine the various IT applications used

in the supply chain operations of the organization. The applications used are Oracle system and WMS which are ERP systems that integrate the various functions of the organization. E-commerce is used for exchanging documents electronically and also exchanging emails and information between the various stakeholders. IT such as GPS, GPRS are one of the tracking systems used to track cargo that is enroute to customers or to the stores.

## **CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS**

### **5.1 Summary**

The paper examines the use of Information Technology in supply chain and how IT is used to increase performance of the supply chain. The study was carried out to benefit the SMEs and professionals in the supply chain so that they can enhance the use of IT to improve the supply chain performance and attain a competitive edge in their businesses. The main objective of the study was to determine the benefits of IT in supply chains and also understand the various IT applications used in supply chain activities. In order to get the information, a case study was done in IET which is an SME and qualitative data was collected from the various staff who work in the supply chain.

An important observation is that IT has improved the processes of transactions across the various functions and also it is integrated in such a way that information flows along the various functions between procurement and planning; logistics and warehouse. The various technologies used have reduced costs of operations in the supply chain and a lot of savings have been achieved. It is also noted that lead time for orders have reduced. There has an improved customer services where both internal and external customers are happy in due to faster response from the supply chain.

Important information is the increase in communication across the various users of the supply chain. Information flows from the sales and planning team to the procurement team and to the logistics team using the oracle system which is an ERP. Documents such as Pos, invoices and requisitions are transmitted using the system and users do not need to physically exchange documents. Audit trails used in the organization have also led to minimal theft of stock in the organization.

### **5.2 Conclusion**

In general, companies should embrace the use of IT in the supply chain to minimize cost and maximize revenue. More focus should be put on the planning and sales function to regulate the buying since customer demands are high and can cost the company millions of money. In

order to meet the current level of demand, the systems in place should facilitate the determination of the current level of demand and also predict future demands to curb stock outs or stock overruns.

Most SMEs do not consider supply chain as an essential function in the organization and procurement is seen as a finance activity. SMEs should consider implementing supply chain and use Information Technology to improve their operations as this will save the companies a lot. The companies should also use IT in planning their procurement activities and engage their stakeholders as well.

The results have also shown how communication is important in an organization that uses procurement. Most of the supply chain in SMEs is not transparent as the managers are known to have a conflict of interest. These results in poor revenues, bad customer service due to delay of product information to customers and also longer lead time. Through the user of IT, all these can be curbed and companies can enjoy longer benefits such as improved sales revenue and reduced inventory costs.

### **5.3 Recommendations**

The study recommends that companies especially in the SME sector should implement IT in their supply chain operations to improve efficiencies as indicated in the diagrams. Levels of sales and customer service have improved over time with the adoption of IT in the supply chain.

Organizations are to integrate the supply chain function with the other functions that are involved in its running to enhance the overall effectiveness and also have a competitive edge over competitors through the resultant better prices and products.

The study also recommends the adoption of technologies that assist in increasing the effectiveness of the supply chain for both the customers and the suppliers. These should be systems that enhance transparency which will in turn improve the goodwill in the organization.



## **5.4 Limitations**

The researcher was not able to get 100% response from the various respondents, mostly due to the tight schedules they were working under. This limited the time they had to respond to the questions they were asked.

Most of the respondents were a bit conservative with information. They feared that the information might be shared with competitors. This decreased the accuracy of the data collected.

Delay resulting from postponement of most set appointments with the respondents. This meant that the researcher had to visit the premises more times than planned and also had to make changes on their schedule.

Biasness from the respondents since the researcher was a former employee of the organization that was being studied.

The increased visits to the organization and also the process of recording the responses collected, was costly to the researcher. The services involved in the analysis of the responses gathered were also an additional cost.

## **5.5 Areas for further study**

A suggestion for further research on the use of IT among the SMEs is to determine the factors that hinder the integration of IT in the SMEs in Kenya.

Research should also be carried out on why supply chain is not a function that is given preference in the operations of most SMEs.

The relationship between the supply chain and the other departments within the SMES should be determined along the effects of such relations on the overall performance of the SMEs.

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## **APPENDICES**

### **APPENDIX I : RESEARCH QUESTIONS TO ASK**

#### **HEAD OF SUPPLY CHAIN**

1. What is your view on IT and Supply chain performance in the organization?
2. Why did you decide to use IT in the supply chain activities of the company?
3. How were the operations in the supply chain before the company decided to implement systems in the organization?
4. How long have you been using IT in supply chain activities?
5. How has IT benefited the organization in terms of supply chain performance?
6. What Information technologies do you use for the supply chain activities of the firm?
7. Supply chain is the main base or the core department in this firm. How do you ensure that the needs of all users are satisfied by avoiding stock outs due to technology?

#### **PROCUREMENT OFFICER**

1. Kindly explain the systems that you use in your day to day operations
2. How do you do purchase orders in the system?
3. Could you give me the advantages of using the system and how you have benefited since you abandoned the manual system?
4. How has IT improved in creating rapport with your supplier?
5. How do you use technology to ensure that the goods purchased are as per the quantity that you ordered?

#### **WAREHOUSE MANAGER**

1. There are several warehouses in this organization. How do you use IT to manage the operations of these warehouses?
2. How do you ensure that there is no theft of materials in the stores from your subordinates using the technology?
3. I have seen that WMS is one of the technologies used in the warehouses when checking stocks. Kindly explain how this technology works.
4. What benefit have you gained since you started using the WMS compared to the manual way of using bin cards and other paperwork?
5. How do you use IT to manage inventory replenishment in the organization?
6. How do you manage shipment codes and tracking information of shipments?

## **LOGISTICS MANAGER**

1. Kindly explain how you use IT to plan and coordinate material flow in the supply chain?
2. How do you pick up the process of logistics after the procurement officer has procured the goods from supplier using IT?
3. What are the systems that you use in your logistics operations in the organization?
4. What technologies have you put in place to track the cargo that is en-route from the supplier's place?
5. How do you go about clearing of the goods that have been procured from international suppliers?

## **SALES & PLANNING MANAGER**

1. How do you use information Technology to manager demand and supply of items in the organization?
2. How do you use IT to avoid stock-outs and stock overruns in the organization?
3. Planning and Marketing is the department that triggers buying in the organization. Kindly explain how you trigger the buying using Information Technology.
4. Kindly explain how you use IT to manage both internal and external customers demand.
5. As a planner, you have to ensure that there is no waste in the supply chain. How do you use IT to plan and also ensure that there is less waste in the supply chain?