

**EXTENT OF ADOPTION OF INFORMATION COMMUNICATION
TECHNOLOGY IN SUPPLY CHAIN MANAGEMENT AMONG
SUPERMARKETS IN KENYA**

BY

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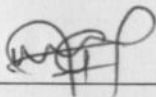
ACKNOWLEDGEMENT

DECLARATION

I, the undersigned, declare that this is my original work and has not been submitted to any other college, institution or university other than the University of Nairobi for academic credit.

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Date 12/11/12

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

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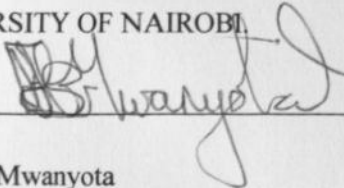
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DEDICATION

I dedicate this thesis project to everyone near me for the love and values we share as a family.

Efficiency and logistics operations while remaining responsive to changing market conditions and customer demands. The information and communication technologies, particularly the use of computers, internet and integrated information systems are quickly changing the way supply of products and service are carried out by different businesses. As a result, organizations need to adopt Information and Communication Technologies to support their supply chains and increase their efficiency by achieving tighter cooperation relationship over the supply-chain. Different business have been adopting Information and Communication Technologies for different purposes at different pace due to various unique reasons and hence the variation in the level of information and Communication Technologies adoption. This study explored the extent of Information and Communication Technologies adoption, and the challenges encountered together with the utilization of Information Communication Technology in supermarkets. The study targeted major supermarkets in Kenya.

The study was conducted through structured questionnaire which were distributed to supermarket in Kenya. Data was analyzed using statistical package and represented using table.

The study shows that many supermarkets have embraced the use of Information and Communication Technologies in different departments and sections. Also there are a number of drivers and barriers that influence the adoption of Information and Communication Technologies solutions in supermarkets in Kenya. The recommendations of this study provide a basis for the need of different stake holders in the sector to work together and also to see how they can work on the challenges that hinder the use of Information and Communication Technologies in supermarkets. Adoption and use of Information and Communication Technologies is a key factor in helping enterprises to raise their productivity and competitiveness.

ABSTRACT

Organizations today are under pressure to better manage the supply chain and to improve efficiency and logistics operations while remaining responsive to changing market conditions and customer demands. The information and communication technologies, particularly the use of computers, internet and integrated Information systems are quickly changing the way supply of products and service are carried out by different businesses. As a result, organizations need to adopt Information and Communication Technologies to support their supply chains and increase their efficiency by achieving tighter cooperation relationship over the supply-chain. Different business have been adopting Information and Communication Technologies for different activities at different pace due to various unique reasons and hence the variation in the level of Information and Communication Technologies adoption. This study explored the extent of Information and Communication Technologies adoption, and the challenges encountered together with the utilization of Information Communication Technology in supermarkets. The study targeted Major supermarkets in Kenya.

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CHAPTER ONE

LIST OF ABBREVIATION AND ACRONYMS

INTRODUCTION

ERP –Enterprise Resource Planning

EFT-Electronic Fund Transfer

DOI- Diffusion of Innovation

ICT-Information Communication Management

SCM-Supply chain management

SPSS –Statistical Product and Service Solutions

TAM -Technology Acceptance Model

TPB-Theory of Planned Behavior

TOE -Technology, organization, and environment

UTAUT-Unified Theory of Acceptance and Use of Technology

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

According to Mentzer et al (2002) supply chains exist in all industries but the number of interrelated firms may vary as well as the degree of integration. Companies strive to improve market share, grow corporate profit, and gain strategic advantage. In order to achieve the organization goals, supply chain competency must be placed at the heart of a company's business model. Firms realize that competition is driven by customer demand. Effective supply chain management can offer customers high quality products and services with low prices. The ultimate goal of supply chain management is to meet customers' demand more efficiently by providing the right product, in the right quantity, at the right location, on the right time, and in the right condition. Lambert and Cooper (2008) state that paradigm shifts are significant to modern business management and there is no individual businesses that can compete solely as autonomous entities, but the firms have to compete as members of supply chain.

The management of multiple relationships across business is being referred to as supply chain management. Supply chain is not a chain of businesses with one-to-one, business- to-business relationships, but a network of multiple businesses and relationships. Supply chain management offers the opportunity to capture the synergy of intra and intercompany integration and management. It deals with total business process excellence and represents a new way of managing the business. (Lambert, 1998)

According to Kraemer (1999), we are in the present era of e-commerce and economic globalization. Acquiring information communication technology to support business needs

regardless of business size, is a crucial prerequisite to exploiting the potential of information technology. It is obvious that the introduction of new technologies in information technology has changed our lives and also the way we conduct business. It is indisputable that information and communication technology has an enormous effect on contemporary business issues. New technologies presently being developed and used in the creation, processing and transmission of information in operations of different business.

1.1.1 Information Communication Technology

Information communication technology can be defined as a family of technologies used to process, store and disseminate information, facilitating the performance of information-related human activities, provided by, and serving both the public at-large as well as the institutional and business sectors (Salomon& Cohen, 1999).

Also information communication technology is a compound term that is used to refer to the convergence of a wide array of new technologies presently being developed and used in the creation, processing and transmission of information in logistics and supply chain management within companies and with customers and suppliers in the supply chain. It is indisputable that information and communication technology has an enormous effect on contemporary business issues. However, the relationship between information and communication technology and the performance of supply chains is less straight forward in many organizations.(Taco van der Vaart, 2010).

Today's business world has been deeply influenced by Information and Communication Technologies (ICT) and the application of Information and Communication Technologies among business is widespread. Information and Communication Technologies are rapidly changing global production, work and business methods and trade and consumption patterns in and between enterprises.Denni (1996) stresses every business must bring Information and Communication Technologies into their business operation and take advantage of the benefits

they offer. Adoption of the Information and Communication Technologies is considered to be a means to enable these businesses to compete on a global scale, with improved efficiency, and closer customer and supplier relationships (Chong et al., 2001).

The emergence of information and communications technologies (ICTs) has affected many industries and organizations. The adoption and use of information and communications technology is widely seen as critical for the competitiveness of firms in the emerging global market. It is extremely important for firms to adopt Information and Communication Technologies in order to maintain their competitive edge, develop a global network of product exchange and establish wider international network. The effective use of information system (IS) and information technology can provide firms with the opportunity to take advantage of Information and Communication Technologies in order to enhance the way they conduct business and increase core competencies. (Nicol, 2003).

1.1.2 Supply Chain Management

Supply chain management is the systematic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole (Mentzer et al., 2001). The ultimate goal of any effective supply chain management system is to reduce inventory and improve efficiency.

According to Christopher, (1998), the supply chain is seen as a network of connected firms that together are fulfilling the promises to the final customers of the chain. The essence of supply chain management is integrated planning of activities across supply chains, including those of its suppliers and customers supply chain management is the systematic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular

company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole (Mentzer *et al.*, 2001).

Hausman, (2001) says that supply chain management serves as the back-end application by linking suppliers, manufacturers, distributors, and resellers in a cohesive production and distribution network in supermarkets. Effective supply chain management in supermarkets can help lower production and distribution costs through seamless cooperation between business partners in their supply chain. In operations management perspective, companies seek to further improve the efficiency in the supply chain by sharing information related to matching demand and supply such as short- and long-term production planning, demand forecasting and materials and capacity planning. Information that can be relevant to share between customers and suppliers typically includes point-of-sales data, forecasts and inventory levels.

1.1.3 Interface between Information Communication Technology and Supply Chain Management

As companies seek to improve the efficiency in the supply chain through increased integration, information communication technology can be considered as a key enabler for supply chain management through its ability to support information sharing and shortening information processing time. Currently it's impossible for any business to do any business and compete with any business without the embracing of information communication technology. Companies in one way or another will always have to use Information technology to compete effectively and also reduce the cost of operation in the organization. Information communication is become a must tool to drive business to the next level, (Gilaninia, 2011)

Chan & Ouchi (2001) stressed that Information communication technology has contributed to the growth of world economy. In the network economy, business applications and management must

embrace the Internet in order to survive. Information systems are described in terms of type of data exchanged and means of Communication used. In the recent past, businesses have been investing heavily in the information communication technology such as internet and integrations of information system to capture maximum benefits of sharing information. There is therefore need for the business, to take a more proactive response to these emergences technologies to assist them in competing and serving its customers at ease. According to (Lee, 1997) supply chain management, information and communication technology has especially been recognized as an enabler for information sharing which companies in the supply chain can use for eliminating the so called bullwhip-effect and also giving the information when need.

Studies on the effects of information communication technology on supply chain management have been done .Bernard,(2012) did a research and found that many business organizations are striving to integrate different aspects of information communication technology in their operations and supply chain management. He discovered that the advent of the Internet led to predict a certain kind of emerging technologies revolution that would profoundly alter the way business operates. Even though the rapid development of emerging technologies attracts the attention of big firms, he found that there are challenges to the effective pedagogical integration and use of these new technologies in business. Supply chains encompass the companies and the business activities needed to design, make, deliver, and use a product or service.

1.1.4 Supermarkets in Kenya

According to Neven & Reardon (2004), supermarkets have rapidly penetrated urban in Kenya and spreading well beyond their initially tiny market niche among the urban middle class into the food markets of lower-income groups. Supermarkets are expanding their sales of products through mass customization, developing private branding of products, using internet encouraging customer loyalty programs whereby they are developing customer cards (Agnese,2003; Blisard

et al., 2002). The supermarkets are penetrating in selling processed and staple food markets much earlier and faster than fresh foods, they have recently begun to make inroads into the fresh fruits and vegetables category. Supermarkets in Kenya already buy about half the volume of produce exported, and thus represent a significant new 'dynamic market' opportunity for farmers. The important changes in their procurement systems bring significant opportunities and challenges for supply of products and services. Supermarkets in Kenya are recognizing the importance of an integrated supply chain and information communication technology for the fresh produce industry.

According Sameer, (2008) a supermarket can be classified into four different categories based on size and breadth of product. These categories include Conventional which is traditional mom and pop stores prevalent in the US market, Limited/warehouse and hard discounters. Offering less than 1,500 items, usually 200-800 square feet, low price and service, Superstore combo. Minimum of 30,000 sq. ft., maximum of 40 percent non-food items and Supercenters and hypercenters. Minimum of 75,000 sq. ft., average 55 percent.

Research Problem

In the recent past, many businesses have been investing heavily in the adoption and use of information communication technology in the supply chain, which is vital to the operation. The information communication technology provides modifications in performing different processes and services in the supermarkets. Information communication technology assists in providing service improvements whilst providing cost benefits through trading partner collaboration and cohesion (Jenkins, 1989). Enhancing supply chain management performance

Table 1.1: Classification of Supermarkets

S/n	Classification	Number of Items	Square feet
1	Limited Warehouse	1500	200-800
2	Conventional	Over 1500	30,000
3	Superstore	40% non food	45,000
4	Supercenters	55% non food	75000

Author: Sameer, (2008)

Supermarkets stores have become very important today in many economies. They do play a crucial role in the overall economy of Kenya contributing 10% to GDP and an estimated total wage payment of Ksh. 86.7 million within the private sector in 2011 (Economic Survey, 2011). Over the last fifteen years, the Kenyan supermarkets have experienced phenomenal growth with major retailers expanding to the broader East Africa and beyond. Supermarkets have positioned themselves for all kind of customer needs and income levels especially the growing young working population. Many supermarkets have been upgrading themselves by re-locating to upcoming modern malls and shopping centers, providing superior shopping atmosphere and experience especially in the urban and semi urban centers. However, it is not clear whether the supermarkets have fully embraced the use of information communication technology and integration of supply chain management concept which emphasis on proper sharing of information to all stakeholders.

1.2 Research Problem

In the recent past, many businesses have been investing heavily in the adoption and use of information communication technology in the supply chain, which is vital to the operation. The use of information communication technology provides modifications in performing different operations and activities in the supermarkets. Information communication technology assists in customer service improvements whilst providing cost benefits, through trading partner collaboration and cohesion (Jenkins, 1989). Enhancing supply chain management performance

has become one of the critical approaches for sustaining competitive advantages for companies (Cai et al., 2009). According to Boubekri, (2001) information communication technology is an enabling strategic tool for improving supply chain performance and facilitates inter- and intra organizational communications.

Dirk,(2008) noted that within information communication technology effort is put into the development of new systems and technologies, that should remedy most, if not all, problems of earlier systems and technologies. There also seems to be a disconnect between “theory” and “practice” in the field of supply chain management and information communication technology as much money is actually spent in purchasing, implementing, running and updating information communication technology in all its diversity, whereas at least in the supply chain management field, all of these aspects are hardly investigated and we do not know how much about effects, proper implementation and relevant factors to consider.

Management of supermarkets in Kenya has not been left behind in the implementation and use of information communication technology in management of their supply chains. Many systems are in use in management of this supply chain. Some of these systems are run online through the internet and others are desktop application which is used within the supermarkets. Currently supermarkets have been able to integrate banks system with their system to enable customers to purchase goods and services using their automated teller machine and credit card. As this is done there is need to investigate the role which information communication technology play in supply chain management.

Woherem,(1993),did the research on the challenge posed by the emerging information technologies and found that procurement of the hardware or lack of skills are not the major challenges.Khayisia,(2004) found that the benefits of information communication technology have yet, and are unlikely to equitably permeate to stakeholders. The reasons behind inequitable diffusion are both historical and socio-economical and most of the supermarkets also lack the

knowledge and skills to use the integrated information communication technology systems used for supply chain management.

Studies on supermarkets in Kenya include Ngatia (2000) who concluded that service quality differs especially in areas that concern dealing with customers. Neven and Reardon (2005) did a research on supermarkets in urban Kenya focusing on the impact of the rise of domestic supermarkets on urban consumers of fresh fruits and vegetables and they concluded that supermarkets have centralized their fresh fruits and vegetables operations over a wide regional store network. Mageto (2009) concluded that supermarkets are trying so much to adopt a lean strategy as they keep only sufficient stock in order to reduce stock holding cost. This shows that several studies have been done on supermarkets in Kenya. This study seeks to answer the questions “To what extent has the information communication technology been adopted on supply chain management of supermarkets? What are the major challenges encountered while adopting information communication technology in supermarkets?”

The above studies have addressed one or several issues related to the role of information communication technology in supply chain management. However, most of those papers grasp one specific aspect of information technology communication only: the use of inter-organizational information systems (Da and Cagliano, 2006), the use of electronic data interchange (Hill and Scudder, 2002), the implementation/use of ERP (Wu and Wang, 2006), or the learning effects in on-line ordering (Kull et al., 2007) and hardly address the trade-offs between different types of information communication technology and/or the trade-off between information communication technology and other forms of information exchange.

1.3 Research Objectives

The purpose of this research was to investigate extent of information communication technology adoption on the supply chain management of supermarkets in Kenya.

The specific objectives of the study will be to:

- i. Determine the extent to which information communication technology has been adopted among supermarkets supply chains in Kenya.
- ii. Establish challenges encountered in adoption and utilization of information communication technology among supermarkets supply chains in Kenya.

1.4 Value of the Study

The finding of this study is very useful to the supermarket players who include distributors, administrators and the government. The managers of these chains can be able to gain knowledge and importance of using information communication technology in driving their business. They can also be able to make informed decision when managing their firms.

Policy makers from this study are able to make informed decision which can improve the supermarkets business for competitive edge. There is also better understanding of how to schedule activities in the supermarkets, forecasting and also managing the inventories of this chain. The policy makers can be able to monitor the control of different sections of their business. They also get to understand the current issues surrounding the adoption and use of Information communication technology in the supply chain management in business and hence contribute knowledge in this area where there has been minimal research.

The findings of the study can be used by researchers for further research work in areas of identified knowledge gap. Researchers with interest of study the same area will be able to do more on this area which very minimal researches have been conducted. Besides, the study will be a basis for further research

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature on information Communication technology, importance of supply chain management, role of information Communication technology and the challenges of supply chain management. It also looks at the theories and the various studies that have been done the area of study.

2.2 Information Communication Technology

Information communication technology is universally regarded as an essential tool in enhancing the competitiveness of an organization. It is commonly accepted today that Information communication technology has significant effects on the productivity of firms. These effects will only be fully realized if, and when, information technology are widely spread and used. It is crucial, therefore, to understand the determinants of information communication technology adoption and the theoretical models that have a risen addressing information communication technology adoption. (Hamelink, 2000)

There has been rapid development of information technologies internationally in the last two decades. According to Hamelink,(1997) information communication technology can positively contribute to economic growth and development. Information communication technology has the potential to reduce poverty and improve livelihoods by empowering users with timely knowledge, reducing transaction costs, and appropriate skills for increasing productivity (Kenny, 2000). Dynamism of Information communication technology is thought to promise fundamental change in all aspects of life, including knowledge dissemination, social networking, economic and business practices, political engagement, education, health, leisure, and entertainment. It is also believed that information communication technology are useful either as tangible goods in

their own right or as value-adding services and they therefore assist the development efforts made by governments (Marker et al,2001; Stiglitz, 1989; World Bank, 1998).

2.3 Information Communication Technology Adoption

Technology adoption is the choice to acquire and use a new invention or innovation. According to Martin and Matlay (2001), adoption and implementation of new technologies is essential to the survival and growth of all business sector. Information and Communication Technologies adoption is referred to the usage of Information and Communication Technologies such as computer hardware, software and network to connect to the internet. The benefits of Information and Communication Technologies adoption and use by firms range from opportunity and market access to operational efficiencies and making enterprises more competitive and successful. Business inter-linkages and networking is greatly hampered to the extent that entrepreneurs do not know about new products in the supply chain or even consumer demands, resulting in market mismatch between demand and supply. Information Communication Technology offers great potential for growth, profitability and competitiveness. To adopt Information and Communication Technologies systems and elements and strategies, the benefits must outweigh investment and maintenance costs. The introduction of Information and Communication Technologies based processes should take into account the specific culture of the company.

The adoption of continuous training solutions can play an important role in increasing the awareness of the huge potentialities of Information and Communication Technologies for concrete situations; in this way employees, managers, and entrepreneurs can acquire a learning culture, integrating the training in their work activities and understanding in depth the potentialities of communication and information tools (Brady et al.,2002; Magretta, 1998; Smith and Blanck, 2002)

2.4 Information Communication Technology Adoption Theories

There are many theories used in Information System research (Wade 2009). The most used theories are the technology acceptance model (Davis 1986, Davis 1989, Davis *et al.* 1989), theory of planned behavior (Ajzen 1985, Ajzen 1991), unified theory of acceptance and use of technology (Venkatesh *et al.* 2003), DOI (Rogers 1995), and the TOE framework (Tornatzky and Fleischer 1990). The Diffusion of Innovation and Technology, organization, and environment framework, are the theories that deal with firms.

Diffusion of innovation is a theory of how, why, and at what rate new ideas and technology spread through cultures, operating at the individual and firm level. According to Teece, (1980) the diffusion of innovation is believed to be a key factor to achieve an overall improvement of the entire supply chain management. Rogers, (2003) stated that the innovation diffusion of new technology has certain situational or environmental factors that impact the adoption.

The innovation diffusion theory (e.g. Rogers, 1995) has been extensively used in studying technology adoption and implementation as well as in the identification of the factors that facilitate or inhibit technology adoption and implementation (e.g. Grover and Goslar, 1993; Ranganathan *et al.*, 2004). The factors that affect information technology adoption and diffusion in an organization are the external environment of the firm and the internal organizational environment. The six factors that are important in web-based systems adoption and diffusion in the supply chain of the extended enterprise include supplier interdependence, competitive intensity, information technology activity intensity, managerial information technology knowledge, centralization, formalization of information technology unit structure. (Ranganathan *et al.* 2004)

On the other hand Technology, organization, and environment identify three aspects of a firm context that influences the process by which it adopts and implements a technological innovation: technological context, organizational context, and environmental context. The

process by which a firm adopts and implements technological innovations is influenced by the technological context, the organizational context, and the environmental context (Tornatzky and Fleisher 1990). Many businesses are affected by technological, organizational and environmental factors which in this research will be measured to see how they affect the adoption of information communication technology in supply chain management.

According Lancaster et al., (2006) intermediaries within a supply chain use electronic data interchange and other types of information technology to send data electronically between different firms. Internet and web based applications are making exchange of information within the supply chain much easier and cheaper (Wang and Zhang, 2005), and consequently many more firms, including small and medium size, are adopting information communication technology systems in their supply chain management activities.

2.5 Supply Chain Management

Supply Chain Management is a network of facilities that produce raw materials, transform them into intermediate goods and then final products, and deliver the products to customers through a distribution system. Information communication technology spans procurement, manufacturing and distribution (Lee & Billington, 1995) the basic objective of supply chain management is to “optimize performance of the chain to add as much value as possible for the least cost possible”. In other words, it aims to link all the supply chain agents to jointly cooperate within the firm as a way to maximize productivity in the supply chain and deliver the most benefits to all related parties

Adoption of Supply chain management practices in industries has steadily increased since the 1980s. A number of definitions are proposed and the concept is discussed from many

perspectives. However Cousins et al.(2006); Sachan&Datta (2005); Storey et al. (2006) provided excellent review on supply chain management literature.

Gunasekaran&McGaughey (2003) extended the scope of supply chain management beyond material management, partnership, information technology to the total quality management areas like management commitment, organizational structure, training and behavioral issues. As firms' survival lies on integration, a good understanding of the integration process is a key aspect in supply chain management. Mouritsen et al. (2003) discussed that basic hypothesis "the more integration (wider the scope) – the better the management of the chain" is not always true and proved that it depends very much on the "environment" of the supply chain and the power relations between the participants in the supply chain.

According to Chou, Tan, &Yen, (2004), effective Supply Chain Management can enable an organization to lower production and distribution costs through seamless cooperation between business partners in their supply chain management. Therefore, Supply chain management can be seen as a source of competitive advantage in different industries. The goals of supply chain management can be categorized as the following, decrease in inventory costs, reduction in overall production costs, improving information flow between business partners and improve customer satisfaction by offering increased delivery speed and flexibility through the seamless cooperation with the distributors and vendors.

Supply chain management can help an organization transform form a traditional linear supply chain into an adaptive network with the following benefits, firms can be more responsive, a firm can sense and respond quickly to changes and quickly capitalize on new opportunities, a firm can also adapt to better and meet customer demands, Information transparency and real-time business intelligence can lead to shorter cash-to-cash cycle times. Reduced inventory levels and increased inventory turns across the network can lower overall costs, it's also possible for firm lower operational expenses with timelier planning for procurement, manufacturing and

transportation, better order, product and execution tracking can lead to improvements in performance and quality hence lowering the costs, a firm can also improve margins through better coordination with business partners and lastly firms are able to have tight connection with trading partners keep your supply chain aligned with current business strategies and priorities, improving your organization's overall performance and achievement of goals.(Xuan Zhang,2011)

The challenges facing Supply chain management differs depending on the type of industry a firm is in and it stems from their interplay and misalignment. One central challenge is to the very idea of “managing” the supply chain. Who could and should have this responsibility? A related challenge is to increase the scope of supply chain management involvement – the “arc of integration” (Frohlich and Westbrook, 2001).Supply chain management has also been affected by outsourcing whereby many firms are outsourcing services. When a firm outsource the work tends to be done not as to the expectations of the company in the long run this tends to be a major failure to the application of supply chain management.

2.6 Relationship between Information Communication and Supply Chain Management

Information communication technology is one of the key resources in any business which has many benefits. Information communication technology has provides internet, as global communication network which provides infrastructure for communications of Supply Chain management participants. Internet also provides platform for Internet based applications which execute supply chain management business processes. Through the use of Information communication technology the supply chain manager are able to get new distribution channel where by different form of e procurement and also enabling new ways of different supply chain.

Information communication technology has also enabled faster and easier collaboration of Supply Chain participants hence supporting easy customer interaction (Stiglitz, 1989).A significant impact of information communication technology relates to the quality of information

available within the supply chain management. Companies can develop Web-based programs or intranets to distribute information, such as about new products, delays or changes. Information communication technology allows everyone in the supply chain management to be integrated and thus, stay informed, which when used appropriately can translate into management efficiently and reduced risk. Market changes readily can be addressed when information communication technology is successfully woven into supply chain management. If economic conditions change and inventory levels are growing (because of little or no sales), then adjustments can be made to decrease manufacturing in firms.

McLaren et al., (2004) stated that when a firm is able to adopt new information communication technology in supply chain management would be a strategic imperative for all successful firms. The right supply chain management enhances an organizational operational efficiency and flexibility.

In general information communication, in supply chain management has enabled great opportunities, ranging from direct operational benefits to the creation of strategic advantage for organizations. Benjamin et al, (1980) argued that information communication technology changes industry structures and rules of competition, creates competitive advantage, and creates new business opportunities. In supply chain management context Bowersox,(1980) outlined that information communication technology is key in supporting companies creating strategic advantage by enabling centralized strategic planning with day-to-day centralized operations. A common view is that information communication technology has a profound impact on managing supply chains. The traditional way of managing supply chains has changed dramatically over the last decade. Face-to-face management, manual tracking systems, paper-dominated order processing systems, and wired communication links were the primary management tools available to supply chain managers. Supply chain management has been integrated with information communication technology tool which include, e-business, electronic

internet marketplaces, extranet and intranet, e procurement all supporting firms to ease business and hence improve flexibility.

RESEARCH METHODOLOGY

2.7 Literature Review Summary

From the review information communication technology is a vital tool for supporting business daily operations. Adoption of Supply chain management practices in industries has steadily increased over the past years. Many firms have embraced the use of information communication technology in supply chain management. Supply chain management and information technology adoption is one of the major activities which business are going through. Information communication Technology, in supply chain management has enabled great opportunities, ranging from direct operational benefits to the creation of strategic advantage for organizations. Use of Information communication technology has enabled faster and easier collaboration of Supply Chain participants. Effective Supply Chain Management can enable an organization to lower production and distribution costs through seamless cooperation between business partners in their supply chain management.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

These chapters discuss the research methodology that include, research design, population, sample size design, data collection and data analysis.

3.2 Research Design

The researcher used descriptive survey research design. The design was appropriate for the study because according to Kothari (2009) survey is concerned with describing, recording, analyzing and reporting conditions that exist or that have existed. Orodho (2009) argues that survey method is widely used to obtain data useful in describing the nature of the existing conditions, identify the standards against which existing conditions can be compared and determining the relationship that exists between specific events.

3.3 Population

Borg & Gall (1996) define population as all members of a real set of people, event or objects to which a researcher wishes to generalize the results of the study. According to Kenya business directory there are 381 supermarkets in Kenya.

3.4 Sample Design

The sample of this study consisted the supermarket chains in Kenya. Random sampling was used where supermarket were selected from the list of all supermarkets provided by the business directory. The researcher selected 100 supermarket for the purpose of this study. The researcher picked every third supermarket from the list; the researched used this to ensure that all the

supermarket had the same chance of being selected. From the directory list some of the supermarkets were not in operational. Data for the study came from self-administered questionnaires which were distributed to respondents. Supermarkets with one branch and those with more than one branch were considered as the only two categories that exist.

3.5 Data Collection

To meet the objectives of the study, the researcher collected pertinent primary data. The main instrument which was used in the collection for the study was a structured questionnaire form. The questionnaire was divided into two parts. Part one focused on the general information of the supermarket. Part two contained information on the adoption and level of utilization of information communication technology on supply chain management and the challenges that the supermarkets are facing as they use information communication technology systems in supply chain management. The questionnaire were distributed by way of drop and pick method. The target respondents comprised of the managers in charge of supply chains, procurement and information technology department.

3.6 Data Analysis

Descriptive statistics was used to analyze the collected data. This was because the data collected was quantative in nature. Descriptive statistics was used to show the way of frequency distribution, percentages and cumulative percentages to analyze the data. Before analyzing the data, all questions were checked to find out whether the questions are adequate, the researcher did this and it was noted that the questions were adequate. The data collected will then be analyzed and interpreted to provide answers to the research questions. Tables, graphs, means and percentages were used to summarize the data. Subsequently the data was translated into specific categories inline with the objectives of the study guided by the questionnaire.

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION

4.1 Introduction

This chapter covers data analysis, discussions and findings of the research. The aim of the study was to investigate the extent of information communication technology adoption in the supply chain management among supermarkets in Kenya. The study achieved a 76% response rate with 76 supermarkets out of the 100 supermarket which were targeted responding. The response rate was considered suitable for analysis.

4.2 Demographic Data

Table 4.1: Gender Representation

Gender	Percent
Male	71.1
Female	28.9
Total	100.0

Source: Research Data (2012)

From the table 4.1 it's clear that most of the officers in both ICT and procurements in supermarkets are male with a 71.1% and the female being very few with a representation of 28.9%.

Table 4.2: Designation of Respondents

Designation	Percent
Clerk	1.3
Manager	61.8
officer in charge	1.3
Owner	1.3
stock manager	1.3
Supervisor	32.9
Total	100.0

Source: Research Data (2012)

Table 4.2 shows 61.8% of respondents were managers, 32.9% were supervisors and 1.3% for clerks, officer in charges and stock manager respectively

Table 4.3: Responsibility of Respondent

Responsibility	Percent
Incharge of ICT	63.2
Incharge of Supplies	36.8
Total	100.0

Source: Research Data (2012)

Table 4.3 Show 63.2% of respondent were incharge of ICT and 36.8 % were incharge of suppliers and operation

Table 4.4: Department of Respondents

Department	Percent
ICT	63.2
Suppliers or Operation	36.8
Total	100.0

Source: Research Data (2012)

Table 4.4 show the department which responded ICT had 63.2% and Suppliers or operation had 36.2%.

Table 4.5: Years the respondents has Worked in the organization

Duration	Percent
Less than 3 Years	18.4
Between 3-5 Years	39.5
Above 6 Years	42.1
Total	100.0

Source: Research Data (2012)

Table 4.5 shows the numbers of years which most of respondents have worked in their respective organizations. 42% have worked for more than six years, 39.5% are those who have worked for 3-5 years and 18.4% are those who have worked for less than years. This is good indication the information which the researcher gathered from most of the staff who has worked for more than five years.

Table 4.6: Level of education of Respondents

Level	Percent
Diploma	43.4
Degree Level	34.2
Post Graduate Level	22.4
Total	100.0

Source: Research Data (2012)

Table 4.6 shows that most of the officers who filled the questionnaires had the following qualification diploma holders were 43.4 %, Degree holder 34.2% and post graduate had 22.4 %. This is a clear indication that the supermarket have qualified personnel to manage the departments

Table 4.7: Status of supermarket

Supermarket Status	Percent
Headquarter	46.1
Branch	50.0
Total	100.0

Source: Research Data (2012)

Table 4.7 shows the location of the supermarket which were selected by the researcher 50.0% were branches and 46.1% were the head quarter of supermarkets. This shows that most of the supermarkets have got more than one branch.

Table 4.8: Branches of supermarkets

Branches	Percent
One Branch	44.7
2-5 Branches	47.4
More Than 5 Branches	7.9
Total	100.0

Source: Research Data (2012)

Table 4.8 show 44.7% were supermarkets with only one branch, 47.4% were those with between 2-5 branches and 7.9 were supermarkets with only one branch

Table 4.9: Items sold on the supermarkets

Items	Percent
Less Than 1500	53.9
Above 1500	46.1
Total	100.0

Source: Research Data (2012)

Table 4.9 show the number of items sold on different supermarkets. Most of the supermarkets sell good less than 1500 with a 53.9% and those which sell above 1500 items had a 46.1%

Table 4.10: Size of supermarkets

Size	Percent
200-800 Square Feet	34.2
30000 Square Feet	34.2
75000 Square Feet	26.3
45000 Square Feet	5.3
Total	100.0

Source: Research Data (2012)

Table 4.10 shows in Kenya we have different sizes of supermarkets according to square feet. Most of the supermarkets in Kenya are those with 200-800 and 30,000 square feet which have 32.5 %.75000 square feet are 25% and very few supermarkets have 450000 square feet which 5%.

Table 4.11: Sources of goods

Sources	Percent
Locally	10.5
Import	27.6
Both	61.8
Total	100.0

Source: Research Data (2012)

Table 4.11 shows that most of the supermarket purchase goods both locally and also internationally. Majority of the supermarkets purchase goods both locally and internationally through importation which are 61.8%. Those which purchase internationally are 27.6% and those that purchase locally are 10.5% and the of the total supermarkets which participated in the study.

Table 4.12: Methods of payment used by most of the supermarket

Mode of payment	Percent
Cash	3.9
Cheques	42.1
EFT	53.9
Total	100.0

Source: Research Data (2012)

Table 4.12 shows that EFT with 53.9 %, cheques 42.1% and cash 3.9% are the most common method of payments which are used by most of the supermarkets.

4.3 ICT Adoption in supermarkets

Table 4.13: ICT Tools used in supermarkets

ICT Tools	Percent
Mobile	39.4
Internet	38.2
Computer	60.5
Printers	65.8
Scanners	47.4
Barcode Readers	78.9

Source: Research Data (2012)

Table 4.13 shows the tools which are commonly used in supermarkets, Barcode readers 78.9, internet 38.2 %, printers 65.8%, Computer 60.5%, scanners 47.4%, and mobile 39.4%..

Table 4.14: Sections Where ICT are used

Section	Percent
Stock Control	39.4
Sales & Marketing	53.4
Design	34.2
Research	63.1
Doc Management	55.3
Production Planning and Control	68.9

Source: Research Data (2012)

Table 4.14 shows that most of the supermarkets have computerized the following department's production planning and control has the highest value of 68.9 %,stock control 39.4%, research 63.1%, sales and marketing 53.4%,design 34.2 %, document management 55.3% .

Table 4.15: Factors Limiting the Use of ICT

Factors Limiting The Usage of ICT	Mean	Rank
Lack of Integrations with other System	4.22	1
Lack of Training	4.07	2
Cost of Technology	3.53	3
Lack of Technological Infrastructure	3.45	4
Too Hard to Use	3.45	5
Inability to use ICT	3.11	6
Fear of Technology	3.29	7
Limited time to spend on Technology	3.09	8
No useful information	2.97	9
Better Alternatives	2.84	10
Do not Understand the Value of ICT	1.88	11

Source: Research Data (2012)

Table 4.15 shows the respondents agreed that lack of integration, lack of training are the major factors limiting the use of information communication technology among supermarkets. Respondents were uncertain that cost of technology, lack of technological infrastructure, too hard to use and fear of technology on the factors limiting the use of information communication technology. Respondents disagreed that there is no useful information and also they do not understand the value of information communication technology as the factors limiting the usage of information communication technology.

Table 4.16: Consequences of Supermarket not Using ICT

Consequences of Not Using ICT	Mean	Rank
Becoming Out of Touch from Suppliers	3.97	1
Wasting Resources	3.68	2
Get Out Of Business	3.63	3
Reorganizing of Business	3.03	4
Loss of Competitiveness	2.45	5
No Consequences	2.26	6

Source: Research Data (2012)

Table 4.16 shows that the respondents were uncertain that when firm does not use information communication technology it becomes out of touch from suppliers, waste resources and also get out of business. Respondents also disagreed that lack of not using information communication technology will lead loss of competitiveness and also no consequences at all.

Table 4.17: Supply Chain Management and Performance

Management	Percent
Close pattern ship with suppliers	44.7
Close partnership with Customers	9.2
E Procurement	27.6
Outsourcing	18.4

Source: Research Data (2012)

From table 4.17 the ratings of how supermarkets manage their supply chain were as follows: close pattern ship with suppliers 44.7%, e procurement 27.6%, and outsourcing 18.4% and Close partnership with customers 9.2%.

Table 4.18: Success in Managing Supply Chain Management

Success	Percent
Not successful at all	7.9
Not successful	22.4
Some How Successful	65.8
Very Successful	3.9
Total	100.0

Source: Research Data (2012)

Table 4.18 shows the statistics of how successful supermarkets are in managing supply chain management is as follows: Somehow successful 65.8%, Not successful 22.4%, Not successful at all 7.9%, Very Successful 3.9%.

Table 4.19: Information System Used in managing supply chain

Information system	Percent
EDI	9.2
ERP	71.1
E-Business	10.5
E-Commerce	3.9

Source: Research Data (2012)

Table 4.19 shows the different system used in supporting supply chain management with supermarkets in Kenya. ERP 71.1%, E-Business 10.5%, EDI 9.2%, E-Commerce 3.9%. This shows that most of the supermarkets have different information system.

Table 4.20: Benefits of Using Information system

Benefits of using Information system	Mean	Rank
Flexibility	4.64	1
Reduced Lead Time in Production	4.62	2
Reduced Inventory Level	4.58	3
Better Quality of Information	4.54	4
Better Operational Efficiency	4.54	5
Increased Coordination Between Department	4.51	6
Forecasting	4.32	7
Cost Saving	4.15	8
Resource Planning	4.07	9
More Accurate Costing	4.07	10
Increased Sales	3.76	11

Source: Research Data (2012)

Table 4.20 shows the respondents agreed that flexibility, reduced lead-time in production, reduced inventory level, better operational efficiency, increased coordination between department and forecast are the major benefits an organization get when it uses information system in its operations. Respondents were also uncertain that when a firm uses information system would increase sales.

Table 4.21: Impacts of ICT Adoption

Descriptive Statistics

Impacts of ICT adoption	Mean	Rank
Perceived Benefits	3.76	1
External Pressure	3.55	2
ICT Knowledge and Skills	3.53	3
Perceived Cost	3.38	4
Government Support	3.34	5

Source: Research Data (2012)

Table 4.21 shows the respondents agreed that perceived benefits, external pressure, ICT knowledge and skills, perceived cost and government support are among the determinant or forces that lead to adoption of information communication technology is supermarket.

Table 4.22: ICT Usage in different supermarkets

ICT Usage	Percent
Poor	7.9
Average	72.4
Good	19.7
Total	100.0

Source: Research Data (2012)

Table 4.21 shows the rating of ICT usage in different supermarkets. The supermarket rated the usage as follows: average 72.9 % and good 19.7%. Poor 7.9%.

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSION AND CONCLUSIONS

5.1 Introduction

This chapter gives a summary of the findings, conclusions and recommendations. The conclusions are drawn from the objectives of the study.

5.2 Summary of the Findings

Martin and Matlay (2001), in his study discovered that adoption and implementation of new technologies is essential to the survival and growth of all business sectors. The finding from the study shows a generally positive attitude toward adoption of Information Communication Technology. From the findings it's clear that supermarkets in Kenya have Information Communication Technology departments which are managed by qualified personnel.

According to Lancaster et al., (2006) study showed that intermediaries within a supply chain use electronic data interchange and other types of information technology to send data electronically between different firms. Wang and Zhang, (2005), study also showed that internet and web based applications are making exchange of information within the supply chain much easier and cheaper and consequently many more firms, including small and medium size, are adopting information communication technology systems in their supply chain management activities. From this study 53.9% of the supermarkets are mostly paying using the Electronic Fund Transfer method to their suppliers, It's also clear that 34.2% of supermarket use barcode readers, 46.1% use computers, 13.2% use scanners, 3.9% use internet as the main technology tools. of Which is a clear indication that most of the supermarket in Kenya have adapted to the use of Information Communication Technology in their operations.

From the findings it's also clear that the usage of information communication technology in production planning and control is 68.9%, research 63.1%, sales and marketing 53.4%, stock control 39.4% and design department 34.2%. The result shows that almost all the section in supermarket and embracing the use of information communication technologies.

As supermarket use Information Communication Technology there are quite a number of factors that are limiting the use of this technology. This factors were found to be, non understanding of the value of Information Communication Technology, limited time spent on technology, better alternatives, fear of technology, inability to use Information Communication Technology, lack of useful information, too hard technology to use, costly technology, lack of infrastructure and lack of new technologies to support different operations in the supermarkets. It's clear from the study that if supermarket do not embrace the use of technology they would waste a lot of resources which is a clear indication that supermarket recognize and they are aware Information Communication Technology assist them to reduce the wastage of scarce resources they have.

The study also shows that 65.8% of supermarkets were somehow successful in managing their supplies using Information communication technology. The most commonly used information systems in the supermarket are the Enterprise Resource Planning.

Hamelink, (1997) did a study and found out that information communication technology can positively contribute to economic growth and development. From this study it's also clear that Information Communication Technology has a lot of benefits when used in the supermarkets, the benefits which the study indentified include flexibility, reduced lead time, better quality of information, reduced inventory level, better operational efficiency, increased coordination between department, forecasting, more accurate costing, cost saving, resource planning and increase in sale.

Hamelink, 2002 study he pointed out that it is crucial, to understand the determinants of information communication technology adoption and the theoretical models that have arisen addressing information communication technology adoption. From the study also shows the adoption of Information Communication Technology in supermarkets is as the result of the following determinants impacts: Government support, perceived benefits, Information Communication Technology knowledge and skills, external pressure. The level of usage of Information Communication Technology in supermarket is clear is average this means that if more is done there is more areas which have not been exploited which the supermarkets can use the Information Communication Technology.

The main determinants of adoption of Information Communication Technology are the lack of infrastructure, financial challenges, complexity of Information Communication Technology and staff perception on Technology. Thus an organization with support of the management and financial capabilities is likely adoption Information Communication Technology in the firm. Larger firms which may be more established and probably desire Information Communication Technology services to boost their production are likely to adopt Information Communication Technology than smaller firms. These results therefore show that adoption and use of Information Communication Technology is a key factor to helping enterprises to raise their productivity and competitiveness.

5.3 Conclusions

The study achieved its objectives where by the extent of adopting information communication technology supermarket among supply chain in Kenya is clearly shown where the researcher found that Information communication technology is used in different department within the supermarkets. These sections include stock control, sales, marketing, design, research, document management and production and control. Also from the study different information communication technology tools are used in supermarkets. The most commonly used tools were mobile, internet, computer, printers, scanners and barcode readers. Nowadays economy must be

understood as a global process. The use and utilization of Information communication technology has provided wide variety of benefits to supermarkets in Kenya. More specifically, Information communication technology has reduced business costs, improve productivity and strengthen growth possibilities. Besides, the adoption and implementation of Information communication technology supermarkets have improved business cooperation, business relationships, quality and diffusion of knowledge. Despite Information communication technology is not a strategic resource itself, it is free available in the market and is valuable, difficult to imitate and nonsustituable (Barney, 1991).

As supermarkets adopt and utilize information communication technology it's clear that this firms comes across so many challenges. Supermarkets in Kenya experience the following challenges, inability to use Information Communication Technology, high cost of purchasing and implementing information communication technology, lack of technology infrastructure, lack of time to spend on the new technologies, lack of information about the new systems available for use, lack of training among other factors.

5.4 Recommendations

There is a need to accelerate the implementation of Information Communication Technology to improve business performance and to stimulate the adoption and utilization of Information Communication Technology by Supermarkets. The stake holders should develop a wide range of policies, and have launch different actions and ad-hoc initiatives to improve and encourage use of Information Communication Technology. However, more often than not, other policy areas where Information Communication Technology plays an important and complimentary role such as in trade and investment, education, infrastructure, law, and national security environment have been neglected and should be thought about.

5.5 Limitations of the Study

The study was carried out successfully but had some limitations. Some respondents were reluctant to give information regarding the study. Time and financial constraints were also other factors that affected the research.

5.6 Recommendation for Future Research

The study focused on extent of adoption of information communication technology in supply chain management among supermarkets in Kenya. The study has provided a useful basis upon which further studies in the industry could be conducted. Most of the research conducted has shown that there is extent adoption of information communication technology in different sectors, it could be of great value if future research could be done on specific sectors and compare the extent of adoption among different sectors to clearly show which sector is leading in adoption and utilization of the technology. The study also contributes to the existing literature in the area of strategies that academicians could use as a basis in their future research.

REFERENCES

- Agnese, J. (2003), "Industry Surveys: Supermarket & drugstores", June 26, available www.standardpoors.com.
- Ajzen, I. (1991) The theory of planned behavior, "Organizational Behavior and Human Decision Processes", Vol. 50, pp 179-211.
- Blisard et al., (2002), "America's changing appetite: food consumption and spending on 2020" *Food Review*, Vol. 25 No.1, PP. 2-9
- Benjamin, R.I., Rockart, J.F., Scott Morton, M.S. & Wyman, J. (1984), "Information Technology: A Strategic Opportunity", *Sloan Management Review*, 25(3), pp. 3-10
- Bowersox, D.J. & Daugherty, P.J. (1995), "Logistics paradigms: the impact of information technology", *Journal of Business Logistics*, 16(1), pp. 65-80
- Brady, M.; Saren, M. and Tzokas, N. (2002). "Integrating Information Technology into Marketing Practice – The IT Realize of Contemporary Marketing Practice". *Journal of Marketing Management*, 18: 555-577.
- Barney, J. (1991). "Firm resources and sustained competitive advantage". *Journal of Management*, 1 (17): 99-120.
- Gall, M. D., Borg, W. R., & Gall, J. P. (1996). *Educational Research: An Introduction* (Sixth ed.). White Plains, NY: Longman.
- Cai, J., Liu, X., Xiao, Z. & Liu, J.(2009). "Improving Supply Chain Performance Management: A Systematic Approach to Analyzing Interactive KPI Accomplishment," *Decision Support Systems*, 46(1). 512 – 521.
- Cagliano, R., Caniato, F. and Spina, G. (2002) E-business strategy: how companies are shaping their supply chain through the internet, *International Journal of Operations & Production Management*, Vol.23, No. 10, pp. 1142-62, 2003.
- Christopher, Martin (1998), *Logistics and Supply Chain Management: Strategies for Reducing*

Cost and Improving Service, 2nd edition. Great Britain: Financial Times / Prentice Hall.

Coyle, J. (2003) Management of business logistics: a supply chain perspective. New Delhi.

South- Western

C. K. Riemenschneider, D. A. Harrison, and P. P. Mykytyn, "Understanding IT adoption decision in small business: integrating current theories," *Information & Management*, vol. 40, pp. 269-285, 2003.

Cousins, P.D., Lawson, B., Squire, B., 2006. Supply chain management: theory and practice – the emergence of an academic discipline. *International Journal of Operations & Production Management*, 26 (7), pp.697 – 702.

Chong, S., Pervan, G., & Bauer, C. (2001). Implementation Success of Internet-based Electronic Commerce for Small-and Medium-sized Enterprises in Australia. *14th International Bled Electronic Commerce Conference*, Bled, Slovenia, June 25-26.

David C. Chou, Xin Tan, David C. Yen, (2004), "Web technology and supply chain management", *Information Management & Computer Security*, Vol. 12 Iss: 4 pp. 338 – 349

Denni, A.R. (1996). Information exchange and use in group decisions making: You can lead a group to information, but you can't make it think. *MIS Quarterly*, 4(2), 433-457

Dirk Pieter van Donk, Taco van der Vaart, (2010) "Guest editorial", *International Journal of Operations & Production Management*, Vol. 30 Iss: 12,

Dirk Pieter van Donk, (2008), "Challenges in relating supply chain management and information and communication technology: An introduction", *International Journal of Operations & Production Management*, Vol. 28 Iss: 4 pp. 308 – 312

Frohlich, M. and Westbrook, R. (2001). Arcs of Integration: An International Study of Supply

Chain Strategies, *Journal of Operations Management*, 19, 185-200.

Gunasekaran, A. and Ngai, E.W.T.(2002) Information systems in supply chain integration and management, *European Journal of Operational Research*, Vol. 159, pp. 269-95, 2004.

Gilaninia,Sh;Chirani,E;Ramezani,E.(2011). The Impact of Supply Chain Management Practices on Competitive Advantage, *interdisciplinary journal of contemporary research in business*, ijcrb.webs.com,VOL 3, NO 6,p577-587.

Gilaninia,Sh;SyedDanesh,S.Y;Amiri,M;Mousavian,S.J.(2011). Effective Factors on Adoption of E-Commerce in SME Cooperative, *interdisciplinary journal of contemporary research in business*, ijcrb.webs.com,VOL 3, NO 6,pp13-21.

Grover, V., and Goslar, M.D. (2003): The initiation, adoption, and implementation of telecommunication technologies in U.S. organizations, *Journal of Management Information Systems*, 10, 1 (summer 1993), 141–163.

Hill, C. and Scudder, G. (2002), “The use of electronic data interchange for supply chain coordination in the food industry”, *Journal of Operations Management*, Vol. 20 No. 4, pp. 375-87.

Hausman W.: Supply Chain Performance Metrics, in Billington C., Harrison T., Lee H., Neale J. "The practice of Supply Chain Management", Kluwer, 2001

Hamelink, C. J. (2000). *The ethics of cyberspace*. London: Sage.

JussiHätönen, Mika Ruokonen, (2010), "Revising marketing strategies for supplier selection criteria: small firm approach from the information and communications industry", *Journal of Business & Industrial Marketing*, Vol. 25 Iss: 2 pp. 159 – 167

Jenkins, J. (1989), “Business networks of the future”, *EDI ± Paperless Transactions for the Nineties*, Data Communications Specialist Group of the British Computer Society.

- John Storey, Caroline Emberson, Janet Godsell, Alan Harrison, (2006), "Supply chain management: theory, practice and future challenges", *International Journal of Operations & Production Management*, Vol. 26 Iss: 7 pp. 754 – 774
- Jaana Auramo, Jouni Kauremaa, Kari Tanskanen, (2005), "Benefits of IT in supply chain management: an explorative study of progressive companies", *International Journal of Physical Distribution & Logistics Management*, Vol. 35 Iss:2 pp. 82 - 100
- Kyalo, S. (2001), "A survey of private labeling strategy by supermarkets in Kenya", Unpublished MBA project, University of Nairobi, Nairobi, Kenya.
- Kinyua, S. (2000), "A survey on outsourcing of selected financial activities by publicly quoted companies in Kenya", Unpublished MBA project, University of Nairobi, Nairobi, Kenya.
- Kraemer, K. et al. (1999). *When Context Matters: Making Sense of Executives' Perceptions on IT Payoffs using Strategic Intent for IT*. CRITO, University of California at Irvine, Irvine, California
- Lysons, K., Brian F. (2005) *Purchasing and Supply Chain Management*. Harlow. Prentice Hall
- Chopra, S. Meindl, P. (2006) *Supply chain management*. India. Pearson Education
- Lee, H., V. Padmanabhan, S. Whang. 1997a. Information distortion in a supply chain: The bullwhip effect. *Management Sci.* 43:546–558.
- Lee, H., V. Padmanabhan, S. Whang. 1997b. The bullwhip effect in supply chains. *MIT Sloan Management Rev.* 38:93–102.
- Lee, HL & Billington, C 1995, 'The evolution of supply chain management models and practices at Hewlett Packard', *Interface*, Vol. 25, no.5, pp.42–63.
- Lambert, D.M., Cooper, M.C. & Pagh, J.D. (2008). *Supply Chain Management Implementation*

Issues and Research Opportunities. *The International Journal of Logistics Management*, 11, (1), 1-17.

Lambert, D. M., Cooper, M. C., and Pagh, J. D.: Supply Chain Management: Implementation Issues and Research Opportunities. *The International Journal of Logistics Management* 9(2), 1-19 (1998).

Martin, L.M. and Matlay, H. (2001), Blanket' approaches to promoting ICT in small firms: some lessons from the DTI Ladder adoption model in the UK, *Journal of Internet Research*, November.

Mark Harvey, (2000) "Innovation and competition in UK supermarkets", *Supply Chain Management: An International Journal*, Vol. 5 Iss: 1, pp.15 - 21

McLaren TS, Head MM, Yuan Y (2004). Supply chain management information systems capabilities: an exploratory study of electronics manufacturers. *Springerlink.Com*, 2(2): 207-222.

Mwanyota, J. L (2004), "Integrating supply chain management and enterprise resource planning systems: A survey of supermarkets in Nairobi", Unpublished MBA project, University of Nairobi, Nairobi, Kenya.

Mentzer J T (2002), *Supply Chain Management*, SAGE publications, London, p 22.

Mentzer, J.T., DeWitt, W., Keebler, J.S., Min, S., Nix, N.W., Smith, C.D. & Zacharia, Z.G. (2001). What is supply chain management. in Mentzer, J.T. (Ed.), *Supply Chain Management*, Sage, Thousand Oaks, CA, pp. 1-25.

Mentzer, J.T., DeWitt, W., Keebler, J.S., Min, S., Nix, N.W., Smith, C.D., & Zacharia, Z.G. (2002). Defining Supply Chain Management. *Journal of Business Logistics*, 22, (2), 1-25.

Mentzer, J.T. (2004). *Fundamental of Supply Chain Management*, Thousand Oaks, California: SAGE Publications.

- Mageto, J.N (2009), "Relationship between supply chain management and supply chain. *Journal of Supply Chain Management*, Vol. 15, No. 4, pp. 28-35.
- Mouritsen, J. (2003) Intellectual Capital and the Capital Market, *Accounting, Auditing and Accountability Journal* (2003, vol. 16, no.1, pp. 18-30) New York, Free Press.
- Natasha Wilson, (1996),"Supply chain management: a case study of a dedicated Supply Chain Management: An International Journal, Vol. 1 Iss: 2 pp. 28 - 35 *Journal of Key Drivers and*
- Neven, D. and Reardon, T. (2004) 'The Rise of Kenyan Supermarkets and the Evolution of their Horticultural Product Procurement Systems', *Development Policy Review* 22 (6): 669-99.
- Neven D, Reardon T (2005). Supermarkets in Urban Kenya: General Research Approach. Policy Brief, 13/01/2005. *Journal of Supply Chain Management*, 2005, No. 1, pp. 55-73.
- NourredineBoubekri, (2001) "Technology enablers for supply chain management", *Integrated Manufacturing Systems*, Vol. 12 Iss: 6, pp.394 – 399 *Supply Chain Management: An*
- Ngatia, E.M. (2000), "A Comparison of Service Providers & Customer Perceptions of Service Quality in the retailing Industry: A Case of supermarkets in Nairobi", unpublished Masters of Business Administration Research Project, University of Nairobi, Nairobi, Kenya. (2000) "A study of the supermarket industry and its growing logistics
- Nicol C. (2003) ICT Policy: A Beginner's Handbook. The Association for Progressive Communications *Journal of Supply Chain Management*, 2003, Iss: 3,
- Orodho AJ 2003. *Essentials of Educational and Social Science Research Methods*. Nairobi: Mazola Publishers. *Journal of Credit Rating, Essays in Monetary Economics in Honor of*
- Oliveira, T and Martins, M, F. "Literature Review of Information Technology Adoption Models at Firm Level" *The Electronic Journal Information Systems Evaluation* Volume 14 Issue 1 2011, (pp110- 121) *Management Journal*, 19(7): 509-533.
- Petri Helo, BulcsuSzekely, (2005),"Logistics information systems: An analysis of software *Journal of Supply Chain Management*, 2005, The process of technology innovation, Lexington, MA.

solutions for supply chain co-ordination", *Industrial Management & Data Systems*, Vol. 105 Iss: 1 pp. 5 – 18

"Value challenges in supply chain management", *Logistics*

Rogers, E.M. (1995) *Diffusion of innovations*, Fourth Edition ed., New York, Free Press.

Ranganathan, C., Dhaliwal, J.S and Thompson S.H.T. (2004): Assimilation and Diffusion of Web Technologies in Supply-Chain Management: An Examination of Key Drivers and Performance Impacts. *International Journal of Electronic Commerce*, Vol. 9, Vol.1, pp. 127.

Simon, R.C., The impact of e-business on supply chain management, *Operations & Production Management*, Vol. 25, No. 1, pp. 55-73, 2005.

Stanley E. Fawcett, Gregory M. Magnan, Matthew W. McCarter, (2008), "Benefits, barriers, and bridges to effective supply chain management", *Supply Chain Management: An International Journal*, Vol. 13 Iss: 1 pp. 35 – 48

Stephen J. New, (1997), "The scope of supply chain management research", *Supply Chain Management: An International Journal*, Vol. 2 Iss: 1 pp. 15 – 22

Sameer Kumar, (2008) "A study of the supermarket industry and its growing logistics capabilities", *International Journal of Retail & Distribution Management*, Vol. 36 Iss: 3, pp. 192 -211

Stiglitz, J. E. and Weiss, A. (1981), (1989), 'Banks as Social Accountants and Screening Devices and the General Theory of Credit Rationing', *Essays in Monetary Economics in Honor of Sir John Hicks*, Oxford, Oxford University Press.

Teece, D. J., Pisano, G., and Shuen, A. (1997). "Dynamic capabilities and strategic management." *Strategic Management Journal*. 18(7): 509-533.

Tornatzky, L. and Fleischer, M. (1990) *The process of technology innovation*, Lexington, MA,

Lexington Books.

W.K. Poon, K.H. Lau, (2000), "Value challenges in supply chain management", *Logistics Information Management*, Vol. 13 Iss: 3 pp.150 – 155

Xuan Zhang, Dirk Pieter van Donk, Taco van der Vaart, (2011), "Does ICT influence supply chain management and performance?: A review of survey-based research", *International Journal of Operations & Production Management*, Vol. 31 Iss: 11 pp. 1215 – 1247

Details of the Respondent:

Name of the Respondent (optional).....

Company (optional)

How many years have you worked with the organization.....

Education level: i) Diploma Level ii) Degree Level iii) Postgraduate Level

Company Detail

Name of the organization.....

How long has the organization been in operation

Headquarter Branch

Number of branches.....

Number of units sold in the supermarkets.....

Below 1500 Above 1500

What is the size of your supermarkets? (in square feet)

Below 300 square feet ii) 30,000 square feet iii) 45,000 square feet iv) 75,000 square feet

How do you purchase your goods?

APPENDICES

APPENDIX I. STRUCTURED QUESTIONNAIRE.

Note: The information will be used strictly for academic purposes only and will be treated with utmost confidentiality. On the items below, please respond as objectively and honestly as possible. In no instance will your name mentioned in the report.

SECTION A:

1.1 Personal Details of the Respondent:

1. Gender of the Respondent (optional).....
2. Designation
3. Responsibility (optional)
4. Department.....
5. How many years have you worked with the organization.....
6. Level of education i)Diploma Level ii)Degree Level iii)Postgraduate Level

1.2 Organization Detail

1. Name of the organization.....
2. Number of years the organization has been in operation
3. Location i) Headquarter ii) Branch
4. Number of Branches.....
5. Number of items sold in the supermarkets
i) Less than 1500 (ii) Above 1500
6. What is the size of your supermarkets? (In square feet)
i) Between 200-800 square feet ii) 30,000 square feet iii)45,000 square feet iv) 75,000 square feet
7. Where do you purchase your goods?

i) Locally [] ii) Import [] iii) Both []

1.3 ICT Adoption

i) What is the name of the information system in your Organization.....

ii) Which ICT tool do you use in your organization?

- Mobile []
- Internet []
- Computer []
- Printers []
- Scanners []
- Barcode reader []

iii) Which of the following department do you use Computers

- Stock control []
- Sales or marketing []
- Design []
- Market research []
- Document management []
- Production planning & control systems []
- Human resource management []
- Enterprise management system []

iii) What are the factors limiting the use of ICT in supermarkets.(Kindly Tick)

The scale are 1.Strongly Disagree 2.Disagree 3.Uncertain 4 Agree 5.Strongly Agree

Limiting factor	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
Inability to use ICT					
Too Hard to use/ unfriendly					
Lack of technological infrastructure					
Cost of technology					
Not useful information					
Fear of technology					
Limited time to spend on technology					
Do not understand the Value of ICT					
Lack of training					
Better alternatives					
Lack of integration with other system					

iv) What are the Consequences for Supermarkets not using ICT?

The scale are 1.Strongly Disagree 2.Disagree 3.Uncertain 4 Agree 5.Strongly Agree

Consequences	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
No consequences					
Loss of competitiveness					
Becoming out of touch from suppliers					
Wasting resources					
Reorganizing of business					
Got out of business					

v) Supply Chain Management and performance

i. How do you manage your supply chain?

	Disagree	Uncertain	Agree	Strongly Agree
a) Close partnership with suppliers			<input type="checkbox"/>	
b) Close partnership with customers			<input type="checkbox"/>	
c) Just In Time			<input type="checkbox"/>	
d) Electronic Procurement			<input type="checkbox"/>	
e) Electronic Data Interchange			<input type="checkbox"/>	
f) Outsourcing			<input type="checkbox"/>	

ii. How successful do you think is your company in managing its supply chain in general?

- Thank you for your time.*
- a) Not successful at all
 - b) Not successful
 - c) Somewhat successful
 - d) Successful
 - e) Very successful

iii) What types of systems are currently in use in your company to support Supply Chain Management?

- (i) Electronic Data Interchange (EDI)
- (ii) Enterprise Resource Planning (ERP)
- (iii) E-business
- (iv) E-commerce
- (v) Others.....

1.4 Impacts on ICT adoption

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
Perceived Benefits					
Perceived Cost					
ICT Knowledge and Skills					
External Pressure					
Government Support					

1.5 Automation: Rate the following factors

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
Level of Usage					
Level of Knowledge					
Effectiveness of the system					
Ease of use					
Prevalent to errors					
Intensity of support Services					

Thank you for your time.

APPENDIX II : List of Supermarkets

1. Tuskys Digo road –Mombasa
2. Tuskys –Bandari
3. Tuskys –Mtwapa
4. Tusky- Kilifi
5. Tuskys –Adams-Nairobi
6. Tuskys Imara Daima
7. Tuskys Mombasa road
8. Tuskys Embakasi
9. Tuskys Digo road –Mombasa
10. Tuskys-Pioneer
11. Tuskys-Beba beba-Nairobi
12. Tuskys-chap chap –Nairobi
13. Ukwala-KIsumu
14. Ukwala -Eldoret
15. Ukwala-Nakuru
16. Ukwala- Nairobi
17. Nakumatt:Oginga Road-Eldoret
18. Nakummatt:Muliro Road-Eldoret
19. Nakummatt-MOi Avenue-Kisii
20. Nakumatt: Moi Highway
21. Nakumatt: junction of Nairobi Road and Ondiek Highway
22. Nakumatt: Karen Shopping Center

23. Nakumatt: Monrovia/Moktar Daddah Street
24. Nakumatt: Mwanzi Road/ Ring Road (Westlands)
25. Nakumatt: Old Embakasi Road
26. Nakumatt: Uhuru Highway (Opposite Nyayo stadium)
27. Nakumatt: Mombasa-Malindi Road
28. Nakumatt:Likoni Ferry
29. Uchumi:Eldoret
30. Uchumi-Kisumu Road-Kisii
31. Uchumi: Kisumu Road Kisumu:
32. Uchumi: Koinange Street
33. Uchumi: Langata Road
34. Uchumi:Waiyaki Way (Westlands)
35. Uchumi: Meru: Mosque Hill Road
36. Uchumi: Haile Selassie Road
37. uchumi.The Sarit Centre - Westlands
38. Uchumi.The YaYa Centre – Hurlingham
39. uchumi.The Village Market – Gigiri
40. Uchumi- Embu
41. Naivas supermarket-Nivasha
42. Naivas supermarket-Ngara Road
43. Naivas supermarket-Mombasa
44. Budge Supermarket -Digo Road Mombasa
45. Budget Supermarket -Moi Avenue Mombasa

46. Budget Supermarket Ronald Ngara Nairobi
47. Magunda Andu supermarket –Embu
48. maguna Andu supermarket-Keroguyo
49. Maguna Andu supermarket-Muranga
50. Jatomy supermarket Embu
51. Wool Mart-Nakuru
52. Wool Mart Nairobi
53. FAIRDEAL SUPERSTORES
54. Nawal Supermarket Mombasa
55. Ebrahim & Co Ltd
56. EASTLEIGH MATTRESSES LTD
57. Eastmatt Supermarket
58. Eastleigh Mattresses Ltd
59. Eagles Supermarket
60. Jack Jill Supermarket
61. Baraka supermarket –Mombasa
62. Deep Supermarket Ltd
63. Dan Selection Store
64. Daily Basket
65. CYFRA ENTERPRISES
66. Crown Supermarkets Ltd
67. City Mattresses Ltd
68. Chiquita's Ltd

69. Chemilil Outgrowers Co Ltd
70. CHAWAKA ENTERPRISES LTD
71. Chai Supermarket Ltd
72. CHARMA GENERAL STORES
73. Broadway Supermarket
74. Brilliant Supermarket
75. Bonyake Grocers
76. Bidha Bora Sales
77. Betccam Savers Supermarket
78. Benvick Supermarket Ltd
79. Bidha Bora Sales
80. Betccam Savers Supermarket
81. Benvick Supermarket Ltd
82. Belion Ltd
83. A One Supermarket Ltd
84. Arassan Mini Market
85. Armed Forces Canteen Organization
86. Arima Grocers
87. Anvi Emporium Ltd
88. African Grocers Ltd
89. Aflose Supermarket Ltd
90. Adams Apple Enterprises
91. Access Supermarket

- 92. ACACIA SUPERMARKET
- 93. Westgate Shopping Mall – Westlands
- 94. Junciton ,Shopping Centre
- 95. Al Maddy Store, Harambee Avenue-Lamu
- 96. Bagdan Store, Harambee Avenue-Nairobi:
- 97. Sona, Galana Malindi: Shopping Centre
- 98. A1 Supermarket: Mombasa: Digo Road
- 99. Bestlady: Mombasa:Digo Road
- 100. Halal supermarkets

TO WHOM IT MAY CONCERN

The bearer of this letter, Geena Muchangi Kyra of Registration number 2517834 2009 is a student of Business Administration (BBA) at the University of Nairobi, Nairobi Campus.

It is required to submit as part of his coursework assessment a research project report. We would like the student to do his project on Extent of Adoption of Information Communication Technology in Supply Chain Management among Supermarkets in Kenya. We would appreciate if you assist him by allowing him to collect data within your organization for his research.

Records of the report will be used solely for academic purposes and a copy of the same will be shared to the interviewed organization on request.

Yours,



GEORGINA O. O. O.
 DEPUTY COORDINATOR, SUPERMOMBASA CAMPUS



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DATE: 06TH SEPTEMBER, 2012

TO WHOM IT MAY CONCERN

The bearer of this letter, Gabriel Muchangi Kiura of Registration number D61/70934/2009 is a Master of Business Administration (MBA) student of the University of Nairobi, Mombasa Campus.

He is required to submit as part of his coursework assessment a research project report. We would like the student to do his project on **Extent of Adoption of Information Communication Technology in Supply Chain Management among Supermarkets in Kenya**. We would, therefore, appreciate if you assist him by allowing him to collect data within your organization for the research.

The results of the report will be used solely for academic purposes and a copy of the same will be availed to the interviewed organization on request.

Thank you.



Mr. JOB MWANYOTA
ASSIST. CO-ORDINATOR, SOB, MOMBASA CAMPUS