

**EFFECT OF SUPPLY CHAIN INFORMATION TECHNOLOGY ON FIRM'S
PERFORMANCE: A CASE STUDY OF SUPERMARKETS IN NAIROBI**

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DECLARATION

This research project is my original work and has not been presented for degree award in any other university. I also declare that this contains no material written or published by other except where due reference is made and outtho duly acknowledged.

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EFFECT OF SUPPLY CHAIN INFORMATION TECHNOLOGY ON FIRM'S

PERFORMANCE: A CASE STUDY OF SUPERMARKETS IN NAIROBI

ABSTRACT

The prevalent embracing of information technologies (IT) characterising the recent competitive advantage views have been of great interest to researchers and practitioners. an important management question today is whether the expected economic benefits of information technology are being attained. There have been conflicting findings in the literature concerning its effect. Due to information technology having become an integral component in supply chain management, it is important to examine its impact on today's organizations. While the information technology literature is mixed regarding the direct benefits of information communication technologies on performance and improving competitive advantage, the impact of business to business enabling technologies on supply chain practices remains largely an unexplored area of research. Therefore this study sought to assess the business value of IT in supply chain to firm performance. The primary research questions are whether and how IT can create competitive advantage and enhance firm performance in the supply chain. Descriptive and analytical tools were employed to conduct the study. This research study's main contribution lied on bridging a research gap by giving evidence that shows how IT can improve the effectiveness of firms' supply chain and enhanced firm performance. The study findings depicted a significant positive relationship between business enhancing technologies and firm performance. In addition, the study established a significant positive relationship between information technology integration and firm performance. A significant positive relationship was also established between information technology complimentary and firm performance. The sample size for this research was 176 respondents with a population of 1760. The researcher applied inferential and correlational analysis. The researcher recommends that Since there a positive significant relationship between business enabling technologies in supply management on firm performance amongst the supermarkets in Kenya then the supermarkets should embrace the use of information technology and update their information systems characteristics so as to minimize the lead time and consequently improve stock management levels.

Key words: Inventory control, E-procurement, Inventory, Lead tim

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DEDICATION

This research project is dedicated to my father and mother for encouraging me to pursue educational advancement at the smallest opportunity available.

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ACRONYMS AND ABBREVIATIONS

EDI:	Electronic Data Interchange
IT:	Information Technology
RBV:	Resource-Based view
ERP:	Enterprise Resource Planning

DEFINITION OF AS PER CACHON,G.P (2001)

- Inventory control refers to the practice of looking at the future production needs

and determining the amount of stock to buy and the time that the goods should be bought including determining which suppliers to order the goods from.

- E-procurement is the use of the internet to carry out businesses.
- Inventories are the portions of the business assets that are ready for sale. They include the rawmaterials,work in progress, finished goods and the supplies that are used in the production of the finished goods.
- Lead time; it's the time taken from the ordering to the time when the item is physically received to satisfy aneed.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Traditionally, supply chain management (Supply chain) has been a melting pot of a range of disciplines, with influences from logistics and transportation, operations management and materials and distribution management, marketing, as well as purchasing and information technology (IT) (Giunipero, Hokker, Joseph-Matthews, Yoon & Brudvig 2008). Supply chain management can be considered as an evolving field of practice and a developing academic domain. Neither perspective is fully mature but each has significant promise. The future progress of each will be enhanced and in fact is ultimately dependent upon the other (Cousins, Lawson & Squire 2006). It has now been at least two decades since initial interest in the supply chain management domain was generated by the practitioner community, and over that time there has been an exponential growth in supply chain management themed studies in the academic press. Several factors are responsible for this increased interest such as the competitive pressures of a global marketplace, potential application of e-business technologies to streamline supply chain management processes, rising costs and shifting power to customers (Giunipero et al. 2008; Kinra & Kotzab, 2008).

It is argued that competition is no longer merely between one company competing with another company, but between an entire supply chain competing with another supply chain (Christopher & Towill 2000). For a supply chain to compete effectively as a unit, the partner companies involved require to share information and coordinate their activities. This becomes more complex as the number of supply chain

partners increase, and the issue with corporate boundaries naturally limiting the flow of information, especially the tacit or latent information flow that generally arises out of frequent, unstructured and unrestricted communication. While the cost of any single communication delay may seem small, the overall value lost is significant.

The development of information technologies provides better information sharing among supply chain members which is vital for close coordination (Lee 2000). This implies that IT provides linkages that can be used to orchestrate all activities across the supply chain. The visibility of information to all supply chain members can overcome problems associated with communication, inventory costs, customer service and utilisation of capacity (Croom 2005; Disney & Towill 2003). Additionally, as the competition between supply chains grows more intense and widespread as a result of inevitable global competition, IT utilisation has changed its role from back office and operational support to strategic imperative. Nowadays, organizations utilize IT to directly influence the processes covering the supply chain (Turban, Leidner, Mclean & Wetherbe 2008; Williams 1997).

According to Faisal, (2007), value in a supply chain is generated by reducing the organisation's or partner's cost of sourcing or sales or increasing the service. In order to achieve this, information technology can be utilized to design and manage intricate information flows amongst organizations (Biehl 2005). Therefore, in the 21st century more emphasis has been placed on integration within and between firms in the processes of information technology, mainly due to the Internet playing the function of a key enabler (Kirchmer 2004). The growth of virtual supply chains is a result of the use of IT to share information between buyers and sellers (Yusuf, Gunasekaran, adeleye &

Sivayoganathan 2004). Hence, supply chains can be considered as an IT enabled inter-Firm configuration where the management of logistics procedures among firms is crucial for good performance (Lewis & Talalayevsky 2004).

Progressively IT is being used to facilitate internal management within a firm and boost external merger with external parties (e.g. supply chain partners) and also to improve making of decisions among members of the supply chain. This occurrence is seen in the progressive usage of information and systems for integration purposes; for example, information systems infrastructure (e.g. information communication tools, network connection, standard data structure and unified coding standards), information systems software (organization-wide information system such as Sap and oracle) and information systems applications (e.g. centralised database management systems, electronic data interchange (eDI) and web based or Internet-based information systems). although the change in information technologies are deemed a main stimulant of supply chain integration, the best way to position these technologies and to direct supply chain-wide activities is still being researched (Gangopadhyay & Huang 2004).

1.1.1. Overview of Retail Supermarket Chains in Nairobi

The increase of supermarkets in kenya is attributed to such factors as increased urbanization; a growing middle class and its changing way of life; and market freedom that has led to rise in the competition in the sector. The supermarket is not a new idea in kenya, having had the first store of its kind in the 1960s (Neven, Reardon 2005). Some of the old players in the retail industry are uchumi Supermarkets, founded in the mid '70s and Nakumatt Supermarkets, founded in 1987. However much increase was not seen in the retail chains until the mid '90s when supermarkets increased from 5 to the

current over 300 stores in kenya (kamau, 2008; Neven and David, 2005). These ranges from well established retail chains to independent one store supermarkets.

As par the Kenya Economic Survey 2012 the retail and wholesale sector increased by 19 per cent in the past five years becoming the second largest driver of economic growth after transport and communication. The dominant players in the sector include Nakumatt, it is privately owned with a turnover of over 20 billion kenya shillings per annum. It is the leading player in the sector with over 19 branches in kenya as well as regional presence through a branch in uganda and another in Rwanda. Nakumatt has been observed as a pace setter in east and Central africa as it is the first retailer to have its stores open round the clock. Tuskys Supermarkets is another prime chain in kenya, ranking second, by sales, in the retail industry. The oldest and once prominent supermarket chain, Uchumi is also very active in the industry. Others include; ukwala, Chandarana, Eastmatt and Naivas Supermarkets which are the newest players.

1.2. Statement of the Problem

Despite acknowledgment among academics and practitioners that IT is now crucial to compete in many businesses (Hulland & Wade 2004), or the fact that some research indicates a strong relationship between IT and improvements in business performance, IT's strategic role as a source for competitive advantage is under scrutiny (Carr 2003; Sircar, Turnbow & Bordoloi 2000). In addition, there is no clear evidence for a direct relation between investment in supply chain IT and firm performance (kohli & Grover 2008).

A number of studies about the impact of IT on supply chain relationships and

performance are increasing (Kim & Narasimhan 2002; Wu, Yeniyurt, Kim & Cavusgil 2006). Determining how well IT in supply chain enables various organisational capabilities in a firm can reduce the complexity of evaluating supply chain value (McLaren, Head & Yuan 2004). although some studies have indicated that IT utilisation can lead to productivity, performance and differential and sustainable competitive advantages because it can strengthen linkages between functions within a firm and between firms (Kim & Narasimhan 2002; Wu, Yeniyurt, Kim & Cavusgil 2006), empirical studies have not shown consistent results. In fact, many studies have pointed out that, in some instances, Supply Chain IT implementation in the supply chain process does not guarantee a stronger firm performance and the impact on firm performance remains unclear.

While top managers are very keen to know the effects of supply chain IT investments on firms' performance the answers to these questions are unclear among practitioners and academics. With this in mind, this study gives the much need step to the information hungry managers, practitioners and researchers toward unveiling the strategic role of supply chain IT in supermarkets where turnover, inventory management and player coordination is very critical.

1.3 Objectives of the Study

The general objective of the study is to find out the impact of supply chain management information technology on firm's performance and the specific objectives are:

1. To asses the impact of business enabling technologies in supply chain management on firm performance.

2. To determine the extent to which information technology has been integrated in supply chain management and its impact on firm performance.
3. To assess the role of information technology complement on supply chain management and its impact on firm performance.

1.4 Research Questions

1. What is the impact of business enabling technologies in supply chain management on firm performance?
2. What is the extent of information technology integration in supply chain management and how it impacts on firm performance?
3. What is the role of information technology complement in supply chain management and how it impacts on firm performance?

1.5 Significance of the Study

Although it is natural that supply chain is possible to have a positive effect on organization performance, most of the evidence in the literature is either anecdotal or based on case studies. There is neither much big empirical evidence of this effect nor structured evaluation and documentation of its magnitude. Furthermore, the supply chain IT literature has focused more on proficiency advancement and cost reduction in supply chain operations and less on the idea of strategic regularity on the features of a product and its underlying supply chain.

1.6 Study Limitations and Delimitations

In the determination to examine the impact of supply chain IT, this study anticipates a number of barriers that are common in survey based research. First, due to

difficulty of coming up with a sufficiently big sample, the study will use the small sample available but go further to purify and validate the measures and then to test the hypothesis. This is a common compromise adopted by many researchers (Cao and Zhang, 2011; Vickery 2003). Second, the study will not survey multiple key sources per firm (to establish inter-rater reliability) (Wagner et al., 2010). Given the background of the respondents and the usage of objective secondary data, the researcher believes that this is not problematic.

Third, as this research is cross-sectional, it cannot establish causality between variables. Only a longitudinal research design could confirm causality or evolutions of key variables over time, which would further allow investigating the dynamic nature of supply chains IT over time

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This current chapter explores the literature in regard to supply chain and IT integration. It comprises sections on theoretical framework, empirical review, literature gaps and conceptual framework.

2.2 Theoretical Review

2.2.1 Resource-Based Theory

The resource-based theory reflects the fact that organizations are heterogeneous and achieve competitive advantage due to occasional, valuable, unique and not substitutable resources and capabilities (Barney, 1991; Dierickx & Cool, 1989; Peteraf, 1993). Resource-Based view (RBV) and its extensions is used to support good relationships that exist between Supply chain IT and Performance. The original approach of the RBV, that focused on the internal resources owned by a firm, was broadened to consider the relationship as a source of competitive advantage. This led to the emergence of the Relational view (RV) (Dyer & Singh, 1998) which assimilates transaction cost theory (Williamson, 1985, 1996) and its critics (Zajac & Olsen, 1993). The RV considers relationships as probable sources of superior performance. This is reflected in four distinct sources that are influenced by more actual governance mechanisms based on informal safeguards, such as trust and reputation. These sources include but are not limited to: investments in relation specific assets, substantial knowledge exchange, complementary and scarce resources, and lower transaction costs (Dyer, 1996, 1997; Dyer & Singh, 1998; Rungtusanatham, Salvador, Forza, & Choi, 2003). These relational resources and

capabilities need to be scarce, valuable, hard to replicate or to substitute in order to provide sustainable competitive advantage (Holcomb & Hitt, 2007).

2.2.2 Transaction Cost Economic (TCE) Theory

TCE theory was originally developed by Coase (1937) to describe the presence of firms and how integration impacted costs and benefits. His conceptualisation is different from the neoclassical economists' view which sees a firm as a production function in which markets were frictionless and information costless. Instead, he believed that there are costs related to the price mechanism and that these "transaction costs" made organising activities within the firm a more efficient choice. Costs encompass those due to accomplishment safeguarding, adaptation and evaluation of events.

This theory was extended by Williamson (1975, 1985, 1991) to predict governance structures based on efficiency considerations. Williamson (1991) stated in relation to the perspective configuration hypothesis that "transactions which differ in their attributes are aligned with governance structures, which differ in their costs and competencies" in a manner that minimises transaction costs. Noticeably, there are logical economic reasons for deciding on how transactions are governed. Three attributes of a transaction - asset specificity, uncertainty and transaction frequency-determine the choice of the appropriate governance structure.

Asset specificity is regarded as one of the most important attributes influencing governance structure (Grossman & Hart 1986; Williamson 1979). It is predicted that transactions or exchange entail high asset specificity, uncertain conditions, recur frequently and will be internalised within a hierarchical governance structure. on the other hand, exchanges or transactions that entail low asset specificity, stable conditions

and are non-repetitive will be more aligned with a market governance structure. Fusion structures are suggested as these attributes are present to a moderate degree.

TCE has been used widely to study inter-firm relationships (Balakrishnan & Koza 1993; Dyer & Chu 2003; Heide & John 1990; Jeffrey & Salancik 1978). Coordination costs and transaction risks are two main components of transaction costs (Clemons & Row 1993). The costs related to sharing information and using that information in decision processes are denoted as coordination costs. These have been referred to as information costs as well (Choudhury & Sampler 1997). Transaction risks take place when the behaviour of transacting parties ex- post (actual) is not in keeping with ex- ante (predicted, forecast) agreements. The possibility of these risks rises when there is information asymmetry. as noted by amit and Zott (2001), companies may embrace IT to lower transaction costs and improve information flows, thereby facilitating improved planning and more coordinated actions to reduce uncertainty. pant and Hsu (1996) suggested how B2B e-commerce can help in reducing operational costs associated with asset specificity. For instance, companies involved in e-commerce see their suppliers more as collaborators who have similar information systems. Hence, companies are likely to move from a large number of suppliers to a smaller number, losing some of their bargaining power but attaining better standardization and enhanced alliances, therefore reducing the asset specific operation costs (McIvor & Humphreys 2004).

2.2.3 Empirical Literature

Companies are turning into integrated supply chain management (ISCM) in order to bridge the gap between trading partners. For example, procter & Gamble, east african Breweries Nakumatt supermarket to cite only a few of a diversified lot has approved ISCM. Focused on refining the flow of materials through the whole supply chain, ISCM techniques are being used to create networks, or trading alliances, that allow the participating firms to compete externally as though they were one entity.

a supply chain is a link that includes dealers of raw materials, plants that transform those materials into useful products, and distribution centers to get those products to customers. Without any specific effort to coordinate the overall supply chain system, each organization in the network has its own agenda and operates independently from the others. However, such an unmanaged system results in inadequacy. For example, a plant may have the goal of maximizing throughput in order to lower unit costs. If the end demand seen by the distribution system does not consume this throughput, there will be an accumulation of catalogue. Clearly, there is much to be gained by managing the supply chain network to improve its performance and efficiency.

Supply chain IT has many definitions, all with a similar underlying theme: integrating the firm's internal processes with suppliers, distributors, and customers (elmuti, 2002; Tan et al., 1999). perhaps the most often cited definition comes from the Global Supply Chain Forum: Supply chain management is the integration of key business processes from end user through unique supplier that provides products, services, and information that add value for customers and other stakeholders (Global Supply Chain Forum as reported in Lambert *et al.*, 1998, p. 1). Stated more simply, IT-based supply chain

systems synchronise and merge the flow of materials, information, and finances from supplier to manufacturer to wholesaler to retailer to the end consumer. Here, IT serves as a key aid of value chain integration through the capture, organization, and sharing of vital information regarding key business procedures, both within and outside a firm's boundaries and contributes to firm profits by refining quality and cycle times and by reducing coordination costs and transaction risks (Stroeken, 2000; Clemons and Row, Mabert and Venkataraman, 1998; Tan et al., 1998; Frohlich and Westbrook, 2001; Sanders and Premus, 2002; Vickery *et al.*, 2003). Thus, we presume IT-based supply chain systems to contribute pointedly to both front-end and back-end improvements in financial performance. The underlying causal linkages connecting capitalising in IT-based supply chain systems to improvements in specific financial performance metrics are based on the conceptual framework proposed by Dehning and Richardson (2002) in which IT investments are proposed to have both direct and indirect effects on firm performance. Here, intermediate process measures (e.g., metrics regarding improvement in inventory turnover, gross margin, and customer service) capture the direct effects of IT investments while recognizing that such investments also indirectly influence overall firm performance measures. For example, supply chain systems can directly improve inventory management (by reduced inventory levels, holding costs, and spoilage) resulting in increased profitability and may also have indirect effects on firm performance through the lowering of coordination and SGA (sales, general and administrative) costs and indirectly improve overall firm performance through improving decision-making and projections.

That IT investments in supply chain can be associated with improved firm

performance has recently been demonstrated by Byrd and Davidson(2003) and vickery *et al.* (2003) but only as measured by overall firm performance metrics such as return on equity (RoE), return on investment (RoI), return on sales (RoS), and market share as reported by survey respondents. We extend their work by examining improved business processes across the entire value chain using publicly reported, audited financial data.

Enhanced integration with suppliers can impact many dimensions of firm performance, including cost, quality, technology, delivery, flexibility, and profits (Gupta and Zhender, 1994; Blaxill and Hout, 1991; krause *et al.*, 2000). With inbound logistics, supply chain system implementations add value through the availability of more current and more accurate information regarding orders that is then shared with suppliers enabling tight coordination of inbound logistics processes. as a consequence, inventory levels and associated costs are reduced while capacity utilizations are increased across the value chain. We therefore expect to observe increases in both raw material inventory turnover and gross profit margin for firm's adopting supply chain systems

2.2.4 Supply Chain Performance

The performance of a supply chain is measured in terms of profit, average product fill rate, response time, and capacity utilization. profit projections may improve if another parameter is relaxed, but one must consider the impact of all aspects of the relaxed parameter on profits. For example, if customers are lost because response time is too slow, then the profit projections may be artificially high. average fill rate can be improved by carrying more inventory in order to reduce stock-outs. The optimal balance must be achieved between inventory cost and lost profits due to stock-outs. Response time often can be improved at the expense of higher overall costs. as with fill rate, the

optimal trade-off should be found. If response time is sacrificed in order to achieve higher profits, sales forecasts may have to be modified if the elasticity of demand with respect to service is significant at the chosen service levels. Capacity utilization should be high enough to reduce overhead sufficiently, but not so high that there is no room to grow or to handle fluctuations in demand. problems often are encountered when capacity utilization exceeds 85%. Lower capacity utilization in effect buys an option for increased output in the future. Higher capacity utilization decreases downside risk since costs are reduced, but also limits the upside gain if future demand should outstrip supply.

2.2.5 Business Enabling technologies and Firm

The literature of Supply chain IT was born on its practical positive impact on firm performance. early research used to report anecdotal evidence about firms that had adopted the supply chain management intergration approach and how this resulted in benefits for the firm and other supply chain members. Great part of this literature was descriptive, reporting practices of successful companies. Supply chain functions are integrated through Electronic Resource Planning (ERP) systems. ERP systems are transactional tools that capture data and reduce the manual activities surrounding the processing of financial, inventory, and customer-order information. These systems achieve a high level of information integration by utilizing a single data model, developing this helps set procedures.

The positive impact of Supply chain IT in performance can be better understood if we interpret its constructs using the relational view. Information sharing maps directly into knowledge exchange. Long-term relationships can help to reduce transaction costs through the development of trust and reputation (Cooper *et al.*, 1997; Mentzer *et al.*, 2001). It

also can contribute to developing knowledge exchange and assure investments in specific assets. Cooperation and process integration can lead to development of both specific assets and complementary resources. Only recently, empirical research has been trying to test the causal relationship between Supply chain IT and performance, especially in USA and Europe. However, large differences in research design undermine comparability and limit generalization. While some studies refer to Supply chain IT as a multidimensional construct (Chen & Paulraj, 2004; Mentzer *et al.*, 2001), others consider only some particular dimension, like cooperation or long-term relationship or assume Supply chain IT is a one-dimensional construct (Wisner, 2003). Studies also differ in terms of unit of analysis: the whole chain (Min & Mentzer, 2004; Wisner, 2003), the buyer-seller relationship (Carr & Pearson, 1999, Narasimham & Das, 2001) or manufacturing and distributor dyad (Griffith, Harvey, & Lusch, 2006). Finally, there is no consensus on how to define and measure performance.

While several studies found a positive relationship between Supply chain IT and performance (Carr & Kaynak, 2007; Chen, Paulraj, & Lado, 2004; Cousins & Menguc, 2006; Droge, Jayaram, & Vickery, 2004; Fynes, Voss, & Búrca, 2005; Gimenez & Ventura, 2005; Johnston, McCutcheon, Stuart, & Kerwood, 2004; Kaufmann & Carter, 2006; Narasimham & Das, 2001; Salvador, Forza, Rungtusanatham, & Choi, 2001; Shin *et al.*, 2000; Vickery, Jayaram, Droge, & Calantone, 2003; Wisner, 2003), others were not conclusive. Weak support for the impact of cooperation on flexibility and delivery (Fynes *et al.*, 2005; Vereecke & Muylle, 2006) and of information sharing on overall operational performance (Krause, Handfield, & Tyler, 2007) are examples of conflicting results.

Many IT business value studies have ignored the synergistic effects of IT with other

organisational factors, such as business strategies, top management support and human related IT. IT does not operate in a vacuum; it works very closely with other organizational assets (Andersen & Segars 2001; Byrd & Davidson 2003; Kearns & Lederer 2000; Li & Richard Ye 1999). For example, many studies investigated the impact of IT infrastructure (related to its usage, connectivity, transaction and diversity) (Chen & Hsiao 2008; Rai, Patnayakuni & Seth 2006; Sanders 2007; Sanders & Premus 2002, 2005; Wu et al. 2006; Zhu & Kraemer 2003) without considering the role of people (human IT resources, e.g. their knowledge and skills) as one of the critical factors for successful adoption and implementation of these inter-organisational technologies (Bharadwaj 2000; Hadaya 2008; Kim, Cavusgil & Calantone 2006; Powell & Dent-Micallef 1997; Power 2005). Customer orientation, IT integration (IT strategic planning), top management support and supplier relationships are some of the key IT organisational resources which are widely cited in the literature (Bharadwaj 2000; Byrd & Davidson 2003; Jean, Sinkovics & Kim 2008; Melville, Kraemer & Gurbaxani 2004; Powell & Dent-Micallef 1997; Wu, Mahajan & Balasubramanian 2003; Yao, Palmer & Dresner 2007). There is no strong evidence as to how different IT resources interact with each other and with other capabilities and business processes to create competitive advantage (Jean 2007).

Finally, research pertaining to IT-mediated supply chain relationships and performance, centres around the direct or indirect relation argument between IT and performance. One of the ways to know how IT improves business performance is the emergent process-oriented approach (Pavlou & el Sawy 2006; Ray, Muhanna & Barney 2005). This shows that IT improves business performance through enhanced business processes, capabilities or structures.

Subramani (2004) examines a model which investigates supplier benefits obtained from IT in supply chain. Companies' relationship-specific investments had an essentially mediating role between patterns of IT appropriations and firm performance. Supply chain integration and dimensions such as coordination and collaboration have also been treated as important business processes which may mediate the impact of IT on supply chain performance (kim, Cavusgil & Calantone 2005; Sanders 2007).

The aim of this study is to conceptualise and investigate the issues related to business value of IT in SC relationships. although some prior research has demonstrated that IT usage does have beneficial performance and productivity impacts, theoretical frameworks are yet to explain whether and how these usages enhance firm performance and create competitive advantage. Thus, the objective of this thesis is to extend current knowledge on whether and how IT usage in supply chain relationships can create firm' competitive advantage and enhance firm performance.

2.2.6 Total Cost of Ownership Measurement and Business Integration Process

Many costs are associated with the development and maintenance of the supply chain. The total cost of ownership (TCO) metric summarizes these costs, then uses present value calculations to discount the anticipated future owner-ship costs over the life cycle of the material or service stream. Serving as a basis for discussion and analysis, the TCO measure is not a precise estimate but rather a way for the channel partners to scope the costs of the planned supply system. This allows for querying projected costs, identifying improvement opportunities, and communicating the benefits that can be gained from enhanced coordination. This therefore explains and clearly indicates the impact level

of integrating supply chain functions to lead time, customer satisfaction and stock level management.

2.2.7 Current Development of ERP

The ERP system providers include some major vendors such as SAP, JD Edward, Baan, Oracle and PeopleSoft. They provide a set of standardized business processes for enterprise management, and promote their packaged ERP applications to improve business performance (Mabert et al., 2000). However, the ERP industry has not been performing as it originally expected. According to an ERP survey, when quantifiable cost savings and revenue gains were balanced against the amount shelled out for software, hardware, consulting help and ongoing support, there is an average negative value of 1.5 million (Stedman, 1999). On the other hand, in order to compete with the fast growing SCM application providers, major ERP vendors are attempting to extend beyond the core functionality of their ERP products to include the SCM capabilities. Evidence of this change can be seen in the numerous acquisitions and strategic alliances formed recently. Baan, for example, acquired supply-chain application vendor Berclain, adding some internally developed supply-chain capabilities to its ERP applications (Electronic Buyers News, 1997). However, as the range of ERP implementation becomes broader, adopting an ERP system is much more costly than before. This problem has seriously limited the market potential of ERP systems. To solve the dilemma, top ERP vendors are developing packaged products rather than full ERP implementation to meet the needs of organizations with different sizes. This is another major change in current ERP market. These packaged products essentially are component-based solutions and thus do not have the breadth of full ERP implementations. These packaged systems normally have a modular approach, which allows quick and customized delivery and installation at lower cost platform. As a result, even medium- and small-sized

companies are able to benefit from the advantages of ERP systems, which were limited to large companies in the past.

2.2.8 *Extending B2B Relationship*

Today's business environment is changing rapidly in terms of business relationships that are forming. Companies must have the ability to establish strong partnerships and clear communication to form an effective supply chain. ERP systems in the past were unable to provide successful links with companies outside of the company operating on that system. The system applications were often set up with the purpose of improving transaction processing within the company and not outside of it. The shift toward B2B e-commerce puts an emphasis on accessing data that reside in the systems of suppliers, customers, and channel partners (Fulcher, 2000). SCM systems are more geared for the B2B relationship because these systems provide the means for closer relations with companies outside of the company. This is a critical advantage for companies as they move into new methods of doing business that require effective methods of sharing information. Reviving ERP market ERP market growth has been reduced considerably, with analysts estimating annual rates of 15 per cent to 17 per cent (Sherman, 2000). Initially the drop was attributed to the Y2K issue, but by now the vendors has recognized that the drop may be related to lack of confidence in the systems (c.f. Wah, 2000). Although ERP packages strive to integrate all the major processes of a firm, customers have discovered the lack of some essential functionality in ERP (Scott and Kaindl, 2000). By examining the problem from two perspectives, the product development and marketing challenge for the vendor and the implementation and integration problem for the consumer, Spratt (2000) reports that the ERP system providers face a more complex problem than organizations managing in-house developed applications. By integrating SCM modules into existing ERP systems, a new market is emergent.

The benefits of SCM software systems would be added to the value of the existing packages and could help boost many ERP vendors' sales. With new business practices such as JIT and SCM taking shape, it becomes even easier for vendors to show customers potential uses of the new packaged systems. The major ERP providers such as SAP and PeopleSoft have put their large stakes in the SCM software industry. SAP as an example has the unique philosophy of allowing its customers to have considerable control over what functions their ERP systems perform. The SCM system solutions at SAP are no different. Initially, SAP attempted to partner with I2 on designing and integrating a software package into existing SAP systems. However, SAP instead has designed a system of their own that is more efficient and less expensive than those of the major SCM providers such as I2 or Manugistics. A benefit is that by linking supply-chain applications with other business systems, users can trim down cycle times, reduce inventory, and better connect with suppliers, distributors, and end customers (Stein, 1998b). As for cross-enterprise application integration, companies are able to link their ERP systems directly to the disparate applications of their suppliers and customers.

2.2.9 Functions of ERP

The major goal of ERP is to unite the various departments across an enterprise through one system application package. The information managed by an ERP system can be utilized in many different ways. For example, executives and employees in production, customer service, accounting and finance are able to rely on the information within the system to make more effective decisions. This system with its ability to share information in today's business world becomes an invaluable tool, which provides various departments with the capacity to work in concert and communicate across a common interface.

2.3 Literature Gap

Existing studies of supply chain IT have several shortcomings when used to model the capabilities enabled in supply chain activities. Firstly, ambiguities in the existing theories and/or using different terminologies for IT capabilities (volume, breadth, diversity, depth) for their contributions towards enhanced performance determines that the conceptualization of IT for IT resources is uncertain, leading researchers to conceptualize and use different terms for IT capabilities and resources (Jean 2007). Secondly, there are ambiguities among researchers in using different business processes and capabilities which interact with IT capabilities in the process of value creation. Finally there are some ambiguities in how various IT resources interact with other capabilities and business processes to create competitive advantage. In addition, empirical evidence on the issue is still fragmented and a comprehensive conceptual framework to integrate different theoretical perspectives is lacking in the literature (Garcia-Dastugue & Lambert 2003; Jean, Sinkovics & kim 2008). Hence, there is a need for a conceptual framework which incorporates the drivers for supply chain IT and IT support for core competences (IT complementary organisational resources) and their impact on firm performance.

This is designed with the main purpose of documenting the research on development of a conceptual framework for the supply chain. The aims of the research will be to develop an integrated framework, and to provide a methodology for planning of many components in the supply chain such as suppliers, materials, resources, warehouses, activities and customers (Birley, 1998). The proposed framework will be based on the unitary structuring technique where stock ordering, receiving of these ,monitoring stock levels and ensuring that varieties are available is all an integrated process to bring about shorter lead times, customer satisfaction, operations routings and distribution networks are

combined into a single structure.

The use of information technology in the management of supply chain will therefore aim at giving specific results to be used in the research project. The design or approach adopted will have the framework being described along with illustrated numerical examples in the distribution environments. The results in the numerical challenge will try to show that each network in the supply chain is able to provide an integrated approach to planning and execution of many components, and is capable of providing visibility, flexibility and maintainability for further improvement in the supply chain environment.

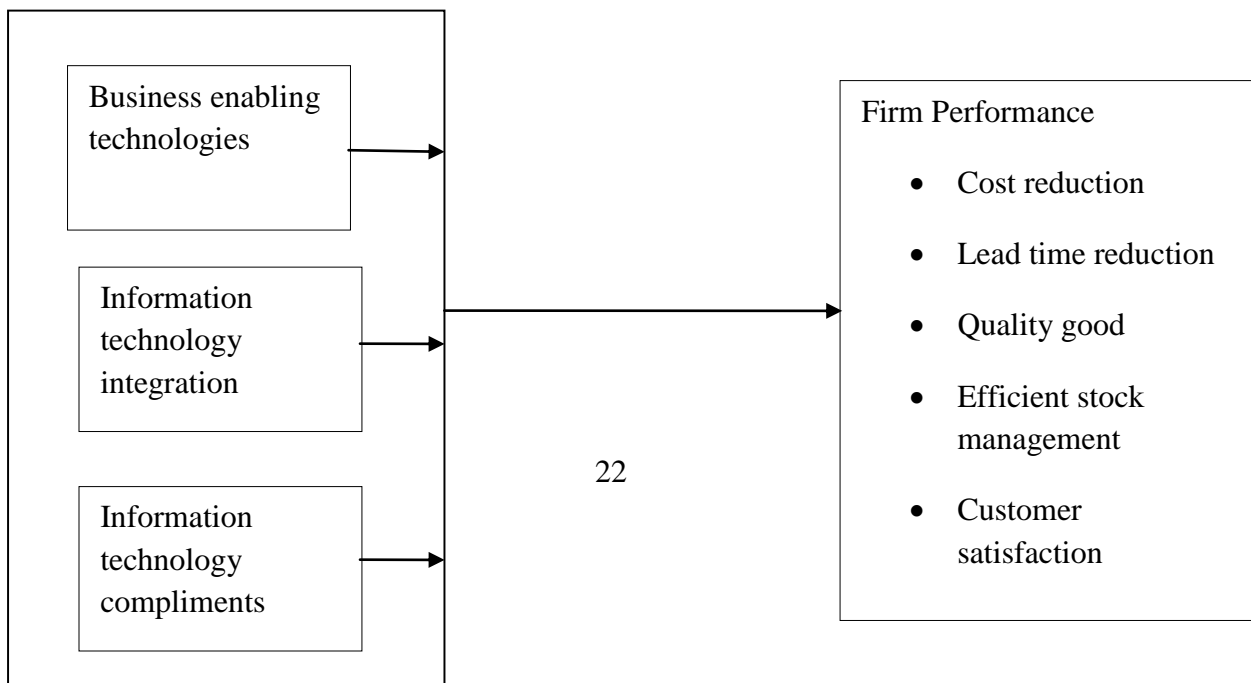
2.4 Conceptual Framework

FIGURE 1

Conceptual Framework

Independent Variables

Dependent Variable



CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter outlines the research design and methodology that the researcher employed in the study. The target population, sampling method and sample size, data collection methods and analysis procedures are also tackled in this chapter.

3.2 Research Design

The research is the combination of the methodology and procedures which will be employed for purposes of conducting the scientific research. This particular research study adopted a descriptive survey design as the research method because respondent's opinions and characteristics about the subject are described. The design was suitable because it gave a broader perspective on the subject matter of the study. The design therefore aimed at finding out details on how the elements of Information technology has been applied in areas of purchasing, supplies and store sections of the various stores that had been selected for the study.

The design adopted for the research was therefore aimed at using a number of data collection methods for purposes of coming up with a broad detail on the research. The design adopted examined the relations that exist between the variables involved in the adoption of information technology by the stores, and thus bring about knowledge on the effects of such adoption for the betterment of the businesses. Interviews were carried out with the involved persons in the various departments of the store where supply chain IT are involved. The researcher visited the places to observe the efforts being put forward by the sampled stores. The adopted design was easily carried out and was more detailed.

3.3 Target population

This is the population that research considered effective in providing adequate information about the procurement and inventory control process. The population of interest included all supermarkets within Nairobi Central Business District (CBD) within a radius of 50km off Nairobi City. The study targets supermarkets in Nairobi. These comprised the 4 major Supermarkets that have embraced technology.

TABLE 1
Target Population

Supermarket	Number of staff
Nakumatt	800
Tuskys	540
Ukwala	270
Uchumi	150
Total	1760

Source: Supermarket pay Rolls FOR; Nakumatt, Uchumi, Tuskys, Ukwala

3.4 Sample Size

Cooper and Schindler (2003), stated that the size of a sample should be a function of the change in the population variables under study and estimating accuracy needed by the researcher. Scholars do not agree on the exact proportion of the accessible population that should form the sample size. Mugenda and Mugenda (2003) suggested that a decent sample is about 10%-30% of the accessible population. In this study therefore 10 percent of the available population will constitute the sample size. This is meant to ensure that there is efficiency, reliability and flexibility in terms of costs

(Kothari, 2007).

TABLE 2
Sample Size

Supermarket	Target Population	Sample size
Nakumatt	800	=800x0.1 = 80
Tuskys	540	=540 x 0.1= 54
Ukwala	270	=270 x 0.1= 27
Uchumi	150	=150 x 0.1= 15
Total	1760	176

Source: survey data

3.5 Sampling

Due to the limited time, financial limitations and the different physical locations of the supermarket, the researcher used convenient sampling technique to ascertain the branches that would form the sampling frame and must be situated within Nairobi county. To reduce collection of biased data and ensure all cadres are represented, proportionate stratified random sampling was used for the study. The researcher classified the population into three strata, that is, the top level management, middle and the lower level management. Stratified sampling was used to achieve representation of the main respondents.

3.6 Data Collection procedure

Data was collected through drop and pick questionnaire system. The preference on the use of questionnaire over other methods of collecting data was because of its ability to extract information from the respondents as well as giving the researcher a better understanding and a more insightful interpretation of the results from the study (Creswell, 2003). The

questionnaire was designed based on the research questions. The structured questions were used in order to conserve time and money as well as to make it easier in analyzing as they were in immediate usable form; whereas the unstructured questions were used so as to encourage the respondents to give a detailed and felt response without feeling the need to making some information secret.

3.6.1 Validity and Reliability of Research Instrument

The aim of the pilot study that was carried out by the researcher was to pretest and validate the questionnaire. According to Kothari (2007), a pilot test was necessary for testing the reliability of data collection instruments. Reliability of research is determining whether the research will truly measure that which it was intended to measure or how truthful the research results will be (Cooper and Schindler, 2003).

This study employed content validity to measure the degree to which data collected through a particular instrument represents a specific domain or content of a particular concept. In other words, content validity checks on whether the findings are really about what they appear to be about. A pilot group of 10 individuals from the target population was selected by the researcher to test the reliability of the research instrument. Reliability was concerned with the question of whether the results of a study are repeatable. The researcher was concerned with the question of whether a measure was stable or not. In order to check reliability of the results, Cronbach's alpha was computed to determine how items correlate among themselves. The use of Cronbach's alpha determined the internal consistency of an instrument.

3.7 Data Analysis

The data was analysed using qualitative and quantitative techniques. For quantitative data, frequency distribution and percentage was employed, whereas for qualitative data, the data in the Likert scale was analysed and used to come up with initial conclusions on the research questions in the study. The researcher expected the respondents to give their opinions on a trait which was analysed and conclusions made. Statistical packages such as SPSS and Ms excel was applied in the analysis of quantitative data where regression, coefficient of correlation was computed to establish the contribution of the independent variables to the dependent variable.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETITION

4.1 Introduction

The current chapter presents the study findings. Both descriptive and inferential statistics were used. The chapter is organized as follows; general information, descriptive statistics for each objective and finally inferential statistics such as correlation and regression analysis.

4.2 General Information

These are the basic information of the sample and their characteristics.

4.2.1 Response Rate

The data collection main instrument was a questionnaire the method of drop and pick was applied owing to the nature of supermarket operations. Out of 176 questionnaires issued only 132 were dully filled and returned froming a response rate of 75%. According to Mugenda and Mugenda (2003) a response of 60% is said to be good and above 70% is said to be more adequate therefore the current study had a good response rate.

TABLE 3
Response Rate

Response	Frequency	Percentage
Responded	132	75
Not responded	44	25
Total	176	100

Source: Survey data

4.2.2 Firm Characteristics

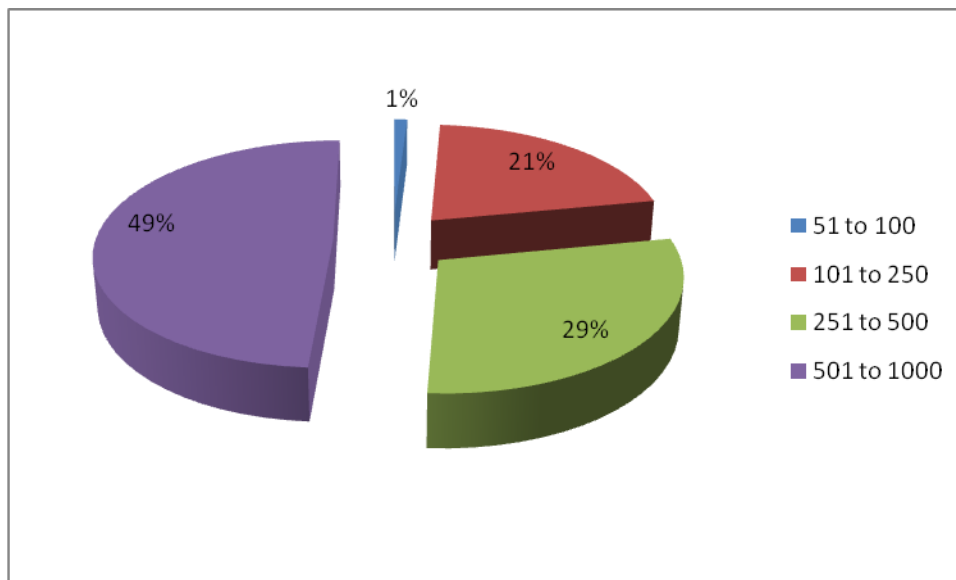
The study sought to find the characteristics which were unique to the specific supermarket. The information sought included number of employees, average monthly sales and the present position held by the respondent.

Number of Employees

The graphical presentation in Figure 2 depicts that on average majority 49% of the supermarkets had employees ranging between 501 to 1000, followed by 29% with 251 to 500 employees. In addition, 21% had 101 to 250 employees while 1% had between 51 to 100. Therefore, most of the main supermarkets operating in Kenya cannot be classified as small or medium enterprises since they have more than 50 employees.

FIGURE 2

Number Of Employees

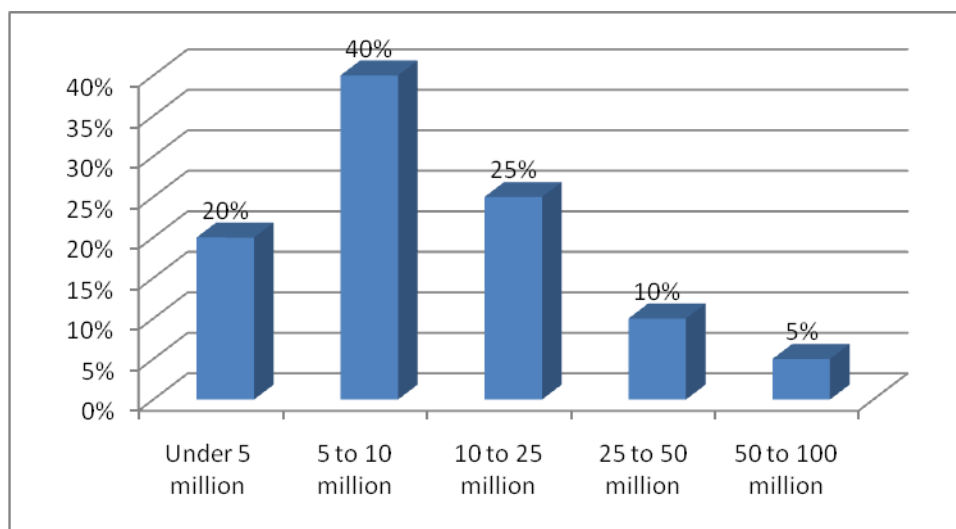


Source: Survey data

4.2.2 Average Monthly Sales

The pictorial presentation in Figure 3 shows that on average majority 40% of the supermarkets had monthly sales of 5 to 10 million, followed by 25% with sales averaging between 10 to 25 million. Further, 20% of the supermarkets had an average monthly sales of under 5 million, 10% earned between 25 to 50 million while 5% earned between 50 to 100 million from sales.

FIGURE 3
Average Monthly Sales

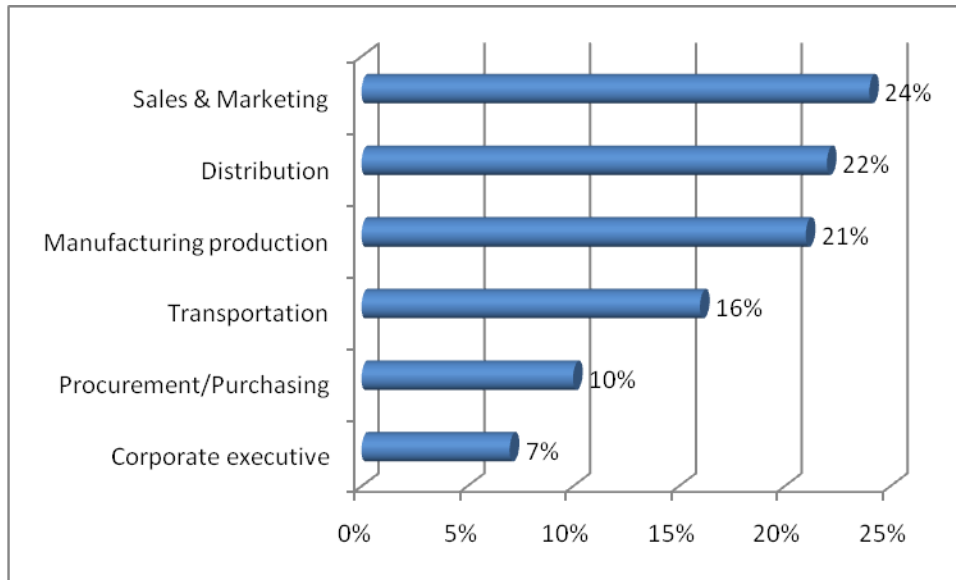


Source: Survey data

Present Job

Having established the monthly sales the study sought to find out the present job held by the respondents. The study findings depicted that majority 24% are currently working in the sales and marketing department, 22% are currently working in the distribution department, 21% of the respondents are currently working in the manufacturing department. Further, 16% of the respondents were working in transportation department and 10% procurement or purchases department. Therefore, the current respondents in the current study were involved in the supply and distribution of goods in the supermarkets.

FIGURE 4
Present Job



Source: Survey data

4.3 Business Enabling Technologies in Supply Chain Management and Firm Performance

The first objective of the study sought to assess the use of business enabling technologies in supply chain management and its impact on firm performance. Results in Table 4 showed that 64% of the respondents reported that their supermarkets have electronic mail system and internet while 58% reported that they have websites for providing products and services information for example catalogue of products. Moreover, 73% reported that they have a website for conducting transactions for example financial transactions, 48% reported that they have extranet which allows external users to access some areas of their organization intranets though the use of passwords. Further, 70% of the respondents reported that they have an enterprise resource planning, while 86% reported that they have embraced the use of electronic data interchange and 66% have embraced the use of barcoding and standards numbering technology. Thus, the four main supermarkets operating in Nairobi have embraced the use of technology in their business transactions.

TABLE 4**Business Enabling Technology And Firm Performance**

Business Enabling Technologies	Yes		No	
	F	%	F	%
Electronic mail system and Internet	85	64	47	36
Website for providing products and services information (e.g. catalogue of products, prices, online sale from products, etc.)	76	58	56	42
Website for conducting transactions (e.g. financial transactions)	96	73	36	27
Extranet (Secure Intranet extension that allows external users access to some areas in an organization's Intranet by using a password)	63	48	69	52
Enterprise resource planning (ERP) systems (e.g. Sap, oracle)	92	70	40	30
Electronic data interchange (EDI/XML) capability	114	86	18	14
Barcoding and Standards numbering technology	87	66	45	34

Source: Survey data

4.3.2: Information Technology Integration in Supply Chain Management and Firm Performance

The second objective of the study sought to find out the extent to which information technology had been integrated in the various organizations and its impact on firm performance. The respondents were supposed to indicate the extent of information technology embracement in their respective supermarkets on a three point Lickert scale. Results in Table 5 shows that majority 84.8% of the respondents reported that their supermarkets transmit their purchase orders electronically at all times. Majority 92.4% of the respondents reported that they receive their suppliers invoice electronically. In regard to payments majority 68.9% do not at all make electronic payments to supplier's invoices while 46.2% exchange their sale or production data with suppliers electronically. Moreover, 53.8% of the respondents reported that they not at all use the data electronically transferred to them by suppliers for electronic decision making. In regard to determination of the quantity to be supplied to us by the suppliers as a result of the information shared to them majority 47% reported that their suppliers sometimes uses the data shared for benchmarking. Finally, 47% the respondents

reported that it is not at all times when they share their market plans with their suppliers while 30.2% of the respondents shares the same at all times electronically.

TABLE 5
Information Technology Intergration and Supply Chain Management

Statements	All the times		Sometimes		Not at all	
	F	%	F	%	F	%
We transmit purchase orders to our suppliers electronically	112	84.8	10	7.6	10	7.6
We receive suppliers invoices electronically	10	7.6	122	92.4	0	0
We make payments for the supplier's invoices electronically	31	23.5	10	7.6	91	68.9
We exchange our sale (or production) data with our suppliers electronically	20	15.2	61	46.2	51	38.6
We use the data, electronically transferred from the supplier, in our business decision	31	23.5	30	22.7	71	53.8
The suppliers determine the order quantity for each item (based on sale data provided by us) and notify us electronically via a purchase order that the order is coming	20	15.2	62	47	40	30.3
We share our promotion plans on the final products with our suppliers electronically	40	30.2	30	22.8	62	47

Source: Survey data

4.3.3: Information Technology Complimentary in Supply Chain Management and Firm Performance

The third objective of the study sought to role of information technology complimentary on supply chain management in supermarkets. To achieve this, the respondents were supposed to indicate their level of agreement on statements in regard to information technology complimentary on a four point Lickert scale. Descriptive statistics such as frequencies and percentage were used as summarized in Table 6. Majority of the respondent strongly agreed that in their supermarkets IT planning is intergarted with the overall business planning while 53.8% agreed that their organization has a formal, long term plan for IT in their organizations. In addition, majority 68.9% disagreed that they regularly measure the bottom line effectiveness of their IT investment and 62% agreed that their CEO

(top level management) often get IT with their supply chain partners. An overwhelming number of respondents strongly disagreed 31.2% and 38.6% disagreed that their CEO endorses major IT spending that has been endorsed by the traditional justification criteria and procedures. In regard to IT expenditure being viewed as a strategic investment by the CEO 31.1% agreed that their CEO views as a strategic investment rather than being an expense to be controlled but 38.6% disagreed on the same. In regard to the businesses being driven by customer satisfaction majority 46.2% agreed that their businesses are driven by customer satisfaction and 38.6% strongly disagreed that their competitive advantage is driven by understanding of their customer needs. It was important to note that 30.3% agreed that their business strategies are driven by the goal of increasing customer value.

TABLE 6
Information Technology Complimentary and Supply Chain Management

Statements	Strongly agree		Agree		Disagree		Strongly Disagree	
	F	%	F	%	F	%	F	%
Our IT planning is integrated with our overall business planning	112	84.8	0	0	20	15.2	0	0
Our company has a formal, long-term strategic plan for IT	30	22.7	71	53.8	31	23.5		
We regularly measure the bottom-line effectiveness of our IT investment	11	8.3	20	15.2	70	68.9	31	23.5
Our Ceo (top level management) often gets of IT with our supply chain partners.	20	15.2	10	7.6	62	47	40	30.3

Our Ceo endorses major IT spending that has not been endorsed by traditional justification criteria and procedures	20	15.2	20	15.2	51	38.6	41	31.1
Our Ceo views IT as a strategic instrument rather than an expense to be controlled	10	7.6	41	31.1	51	38.6	30	22.7
Our business objectives are driven by customer satisfaction	10	7.6	61	46.2	41	31.1	20	15.2
We closely monitor and assess our level of commitment in serving customers' needs	31	23.5	20	15.2	20	15.2	61	46.2
Our competitive advantage is based on understanding customers' needs	20	15.2	31	23.5	30	22.7	51	38.6
Business strategies are driven by the goal of increasing customer value	21	14.9	40	30.3	51	38.6	20	15.2

Source: Survey data

4.4 Firm Performance

The dependent variable of the study was firm performance, it was measured on several parameters of a four point Lickert scale the respondents were requested to indicate their level of agreement on the overall impact of emracement of IT on supply chain management and its influence on firm performance. Results in Table 7 shows that 31.8% agreed that there was an overall cost reduction upon use of IT in the supply chain management. In addition, 39% strongly agreed that there was an overall reduction in the lead time in supply chain process courtesy of information technology. An overwhelming number of resepondents agreed that there was better quality of the good supplied due to information technology, while 31.1% agreed that there was bette stock management levels and 31.8% agreed that customer satisfaction was improved due to the use of IT in supplay chain management.

TABLE 7

Firm Performance

Influence on IT adoption on firm performance	Strongly agree		agree		Disagree		Strongly Disagree	
	F	%	F	%	F	%	F	%
Overall cost reduction	30	22.7	42	31.8	50	38	10	7.6
Reduction of the lead time in supply chain process	51	39	20	15.2	21	15.9	40	30
Better quality of goods sourced	10	7.6	61	46.2	30	23	31	24
Better management of stock levels	11	8.3	41	31.1	40	30	40	30

Source: Survey data

4.6: Inferential Statistics

The study applied correlation analysis to determine the strength of the relationship between firm performance and business enabling technologies, information technology integration and information technology complementary. In addition, regression analysis was applied to measure the nature of the relationship between the dependent and independent variables study findings are summarized in Table 8 and 9 below.

4.6.1: Correlation Analysis

The correlation matrix indicates that there was a significant positive relationship between firm performance and business enabling technologies as indicated by a correlation coefficient ($\rho = 0.754$). Thus, it can be implied that an increase in business enabling technologies is associated with an increase in firm performance.

Secondly, there is a positive significant relationship ($\rho = 0.853$) between firm performance and information technology integration. Therefore, it can be deduced that an increase in information technology integration among the supermarkets will lead to increased firm performance.

There was a significant positive relationship between firm performance and information technology complementary among the main supermarkets in Kenya. Therefore, it can be deduced that an increase in information technology complementary is associated with improved firm performance.

TABLE 8
Correlation Analysis

	Firm Performance	BET	ITI	ITC
Firm Performance	1			
BET	0.754**	1		
ITI	0.853**	0.542*	1	
ITC	0.953**	0.841**	0.885**	1

Key ** *P* value <0.001 * *P*value <0.05.

BET- Business Enabling Technologies

ITI- Information technology intergration

ITC-Information technology characteristics

4.6.2: Multi Linear Regression for Explanatory Power

The F statistic is used as the test for the model goodness of fit an F of 25.865 and p value <0.05 indicates that the overall regression model is significant, thus it has some explanatory power. This indicates that business enabling technologies, information technology integration and information technology complimentary in the Kenyan main supermarket affects firm performance. Since the p value is less than 0.05 it means at 95% level of confidence the predictor variables do influence supermarket performance through their influence on supply chain management.

From the results shown in Table 9 the model shows that the three predictor variables when combined have an explanatory power 75.2% on firm performance as indicated by an R squared. The remaining percentage is explained by other factors not included in the model.

In regard to the nature of the relation between business enabling technologies and firm performance, results showed that there is a significant positive relationship between business enabling technologies and firm performance ($\beta=1.345$ $t=2.05$, p value<0.05). This implies that a unit change in business Enabling Technologies leads to 1.345 increases in firm performance.

Secondly, the results depicted that there is a significant positive relationship between information technology integration and firm performance ($\beta=1.987$ $t=1.92$, p value <0.05). This implies that a unit change in information technology integration leads to 1.92 increases in firm performance.

Finally, the study findings showed that there is a significant positive relationship between information technology complementary and firm performance ($\beta=2.576$ $t=2.37$, p value <0.05). This implies that a unit change in information technology complimentary leads to 2.576 increases in firm performance.

TABLE 9

Regression Analysis

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	6.798	4.612		1.47	.000
BET	1.345	0.657	0.376	2.05	.000
ITI	1.987	1.035	0.0956	1.92	.000
ITC	2.576	1.087	0.0234	2.37	.000
R	0.867				
R Squared	0.752				
Adj R Squared	0.744				
F	25.865				.0000

$Y=6.798 + 1.345x_1 + 1.987x_2+2.576x_3$

x₁- Business Enabling Technologies

x₂- Information technology intergration

x₃-Information technology characteristics

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMEDATIONS

5.1 Introduction

From the analysis of the study findings the current chapter presents the summary, conclusion and recommendations of the study.

5.2 Summary of Research Findings

The main objective of this study was to find out the impact of supply chain management information technology on firm's performance. To achieve this primary data was collected using a structured questionnaire from a sample of 176 respondents and only 132 were returned. Data

collected was analysed through the use of descriptive and inferential statistics. Descriptive research design was adopted to ascertain and be able to describe the characteristics of variables of interest.

The assessment of the business enabling technologies on supply chain management revealed that the main supermarket in Kenya have embraced the use of electronic mail system, use of intranet, have operating website in which they can view catalogues and they have embraced the use of IT to execute for organization decisions such as authorization of payment transactions. The study findings revealed that there is a significant strong positive relationship between business organization characteristics on supply chain management and firm performance.

The second objective sought to find out the level of information technology integration on supply chain management and its impact on firm performance. Results of the study showed that majority of the main supermarkets have integrated information technology in their supply chain management whereby 84% agreed that they use information technology for purchasing purpose. In addition, the study showed that there is a significant strong positive relationship between information technology integration on supply chain management and firm performance among the main supermarkets in Kenya.

The third study objective sought to find out the role of information technology complementary on supply chain management in regard to firm performance. The results of the study showed that in most of the main supermarkets information technology is viewed as a tool for strategic positioning rather than an expense, also most of the respondents reported that thought information technology the level of customer satisfaction has been improved. Majority

of the CEO (top management) in the supermarket not only use information technology as a tool for communication with suppliers but they also approve for IT acquisition without following the traditional acquisition procedures. Further, the findings depicted that there is a significant positive relationship between information technology complimentary and firm performance.

5.3 Conclusion

On overall the study findings have depicted business enabling technologies, information technology integration and information technology complimentary in relation to supply chain management account for 75.2% of the firm performance. Therefore, the procurement and supply management team in the local supermarket should fully co integrate the three in their firm's procurement systems so as to attain optimal performance.

From regression analysis the most significant factor is information technology complementary therefore the supermarkets should adopt all the information technology compliments which will assist them to operate optimally.

Since there is a significant relationship between information technology integration in relation to supply chain management strongly influence firm performance. There is need for integration of information technology in the procurement process to be improved and consequently reduce the operational cost, improve stock management and increase the level of customer satisfaction.

5.3 Recommendations

Since there a positive significant relationship between business enabling technologies in supply management on firm performance amongst the supermarkets in Kenya then the

supermarkets should embrace the use of information technology and update their information systems characteristics so as to minimize the lead time and consequently improve stock management levels.

Secondly, the study has revealed a positive significant relationship between information technology integration in relation to supply chain management and firm performance. Supermarkets operating in Kenya should integrate their supply chain system and customize it fully to meet the unique needs of their customers.

Since the study has revealed a positive significant relationship between information technology complimentary in relation to supply chain management and firm performance. Supermarkets in Kenya should complement fully all their procurement process with the relevant technology so as to be effective in their operation, minimize operations cost and attain optimal levels of customer satisfaction.

5.5 Suggestions for Further Studies

Since the current study was carried out among the supermarkets operating in Nairobi a similar study should be carried out amongst small and medium supermarkets operating in Nairobi. Also some supermarkets operate in more than one region a comparative analysis should be undertaken to confirm whether the current finding's holds.

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APPENDICES

APPENDIX 1

Letter of introduction

.....

.....university

P. o. Box, Nairobi,

Kenya.

Dear Respondent

REF: THE IMPACT OF SUPPLY CHAIN INFORMATION TECHNOLOGY ON FIRM'S PERFORMANCE. A CASE STUDY OF SUPERMARKETS IN NAIROBI

I am a Masters Student in at.....university currently carrying out a research on the impact of supply chain information technology on firm's performance, a case study of supermarkets in Nairobi. The research is part of requirement for my program in the university.

kindly fill the questionnaire as honestly as possible to enable this research to be successful. The information you give is needed purely for academic research and will be treated as confidential.

Your assistance and cooperation is highly appreciated. Thank you.

Yours truly

.....

APPENDIX 2

Questionnaire

The research aimed to examine the impact of supply chain information technology on firm's performance. It is hoped that the findings of this research will be of benefit to you by assisting you to improve the current supply chain practices to gain competitive advantage.

This survey consists of four sections and is designed to be completed in 10 to 15 minutes. Your answers will only be seen by the researchers, and only aggregated data or general findings will be reported. No question requests your name or the name of your company which means that you and your company cannot be identified.

Completion of this questionnaire is taken as your Informed Consent to participate in this research. Informed Consent means that all questions about the research have been answered to your satisfaction. Your participation in the research is voluntary

SECTION 1

IT capability: This section includes questions on electronic integration, human IT resources and IT complementary organisational resources which all describe your company's IT capability in relation to business to business (B2B) supply chain activities.

SECTION 1.1

Electronic Integration: The following situation describes the extent to which your company has

electronic integration via information technology (IT) particularly business to business (B2B) enabling technologies with your major suppliers. When answering this section please think of a few major suppliers whom you deal with directly. Kindly, choose a number to show to what extent you agree or disagree with the statements listed below. Selecting 1 means all the times 2 for sometimes and not at all. You may select any of the numbers in between to indicate the strength of your agreement.

In my company (Managers)

Statements	1	2	3
We transmit purchase orders to our suppliers electronically			
We receive suppliers invoices electronically			
We make payments for the supplier's invoices electronically			
We exchange our sale (or production) data with our suppliers electronically			
We use the data, electronically transferred from the supplier, in our business decision			
The suppliers determine the order quantity for each item (based on sale data provided by us) and notify us electronically via a purchase order that the order is coming			
We share our promotion plans on the final products with our suppliers electronically			

SECTION 1.1

IT complementary organizational resources: The following situation describes your organizational resources which are complementary IT (B2B enabling technology) resources. please select the appropriate number to indicate the extent to which you agree or disagree with each statement as applicable to your company's situation.

- 1: Strongly agree
- 2: agree
- 3: Disagree
- 4: Strongly disagree

In my company IT Managers.

Statements	1	2	3	4
our IT planning is integrated with our overall business planning				
our company has a formal, long-term strategic plan for IT				
We regularly measure the bottom-line effectiveness of our IT investment				
Level of IT commitment				
our Ceo (top level management) often gets of IT with our supply chain partners.				
our Ceo endorses major IT spending that has not been endorsed by traditional justification criteria and procedures				
our Ceo views IT as a strategic instrument rather than an expense to be controlled				
Customer orientation Strongly Disagree Strongly agree				
our business objectives are driven by customer satisfaction				
We closely monitor and assess our level of commitment in serving customers' needs				

our competitive advantage is based on understanding customers' needs				
Business strategies are driven by the goal of increasing customer value				

SECTION 2

Firm performance: The following statements measure overall performance of your company (market and financial performance). When answering this section please think of a few major competitors in your type of business.

1.Strongly agree

2: agree

3: Disagree

4:Strongly disagree

Statements; Do you think adoption of supply chain IT use in your organization has;	1	2	3	4
Financial performance				
enabled better performance in overall cost reduction?				
enabled better performance in shortening the lead time in the supply chain process?				
enabled better Quality of goods sourced?				
Market performance perception				
enabled better management of stock levels?				
enabled better customer satisfaction level?				

SECTION 3

Your organization business enabling characteristics: The following questions are for classification purposes only. In this section you may select more than one item as

5 to 10 million []

10 to 25 million []

25 to 50 million []

50 to 100 million []

please indicate your present job function

Corporate executive []

procurement/purchasing` []

Transportation []

Manufacturing production []

Distribution []

Sales & Marketing []

other (please indicate) _____

Your job title

Ceo/president []

Director []

Manager []

other (please indicate) _____

THANK YOU SO MUCH FOR YOUR TIME. IT IS VERY MUCH APPRECIATED

APPENDIX III

Budget for project writing and preparation

ITEM	ESTIMATE(KSHS)
Developing proposal	10,000
Transport	8,000
Information and data gathering/collection	2,000
Data analysis	20,000
editing	2,000
printing and Binding	8,000
Labor	20,000
Miscellaneous	5,000
Total	75,000

APPENDIX IV
Time frame/ schedule

Activities	MONTHS/2014						
	JAN	Feb	Mch	Ap	May	June	July
Collecting information and developing a research topic							
Writing and developing research proposal							
Correcting and typing research proposal							
Collecting and analyzing data							
Writing the research report, typing ,corrections and editing							
Binding report for submission							