

**EFFECT OF E-COMMERCE IMPLEMENTATION ON SUPPLY CHAIN
PROCESSES AT SOUTH NYANZA SUGAR COMPANY LIMITED-KENYA**

BY

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A RESEARCH PROJECT

**SUBMITTED IN PARTIAL FULFILMENT FOR THE REQUIREMENTS FOR THE
DEGREE OF MASTER IN BUSINESS ADMINISTRATION**

SCHOOL OF BUSINESS AND ECONOMICS

MASENO UNIVERSITY

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ABSTRACT

Electronic Commerce (E-Commerce) has made Supply Chain Management (SCM) technically viable in the world. With the advancement of technology; many production firms have found it necessary to digitalize their production systems to attain competitive edge. This is necessary for improved interaction with their customers. Kenya Sugar Industry, and in particular Sony Sugar Company is in the process of utilizing e-commerce and specifically in the procurement department. However in the endeavor to implement e-commerce in their Supply Chain Management, not much has been done to gauge the level of effect between Information and Communication Technology implementation and the supply chain output. The purpose of this research was therefore to study the effect of e-commerce implementation on supply chain processes at South Nyanza Sugar Company Limited. The objectives of the study were to establish the level of influence of e-sourcing on the supply chain processes, to establish the level of influence e-cataloguing on the supply chain processes and to establish the level of influence of e-tendering on the supply chain processes. The study was guided by a conceptual framework where the independent variables were forms of e-commerce as e-sourcing-cataloguing and e-tendering while dependent variables were supply chain processes such as goods flow, materials flow, information flow and customer relations. The study adopted a correlation case study design. The target population was forty members of staff from both Information and Communication Technology and procurement departments. Due to small population, census sampling was utilized. Both primary and secondary data was utilized in the study. Primary data was collected using structured questionnaires while secondary data was obtained through document review. Data was analyzed using inferential statistics. The findings of the research were presented in form of tables. The results and findings of the study may be helpful in both policy formulation and advancement of new knowledge. The research found out that Sony Sugar Company has not fully implemented electronic commerce forms in its supply chain processes thus does not fully benefit from the advantages generated by electronic commerce. The findings revealed that the independent variables; e-sourcing ($\beta_1 = .231, p < 0.05$), e-cataloguing ($\beta_2 = 0.121, p < 0.05$) and tendering ($\beta_3 = .249, p < 0.05$) had a positive influence on the dependent variables; supply chain processes. The researcher made the following recommendations: that Sony sugar should collaborate with the government in seeking for support so as to fully implement e-commerce; that there should be early supplier involvement and adaption in order to reap from the benefits of e-purchasing and that Sony Sugar should apply the World Trade Organization systems for liberalization so as to abide by the multi-lateral agreements on e-commerce. The researcher therefore calls upon more researchers to explore knowledge in E-commerce by carrying out various studies in E-commerce. This will enable more firms to be aware of the importance of implementing e-commerce and the benefits that accrue by doing the same.

CHAPTER ONE

Introduction

This chapter captures the background of the study, statement of the problem, objectives of the study, significance of the study and the study's conceptual framework.

1.1 Background of the study

A supply chain can be defined as the flow of materials through procurement, manufacture, distribution, sales and disposal, together with associated transport and storage between different organizations trading together (Lysons and Brain 2006). SCM is essentially the management of the relationship and activities among the trading partners. These relationship range from single transaction to complex independent relationship. As the business environment becomes more complex organizations recognize that many benefits can be obtained from closer, long-term relationships (Ganesan, 1994). The main aim of SCM is the member organization to work together in close long-term relationship to increase the competitive advantage of the supply chain as a whole (Mentzer *et al*, 2001)

The phenomenon known as "the next business revolution "the nexus of computers, networks, peoples and business goals for purpose of selling goods and services and information is an innovative way to cut costs ,grow markets and profitability and improve shareholders return relative to traditional business methods (Palmisano, 1998). This combination is the business phenomenon referred to as e-commerce; the trade of goods and services that take place electronically, such as over the internet, e-sourcing, e-cataloguing and e-tendering (Dobler, *et al* 1998).

The ratio of online business trade to traditional channel is projected to vary greatly by industry from a high of over 20 percent for computing to just over one percent for industrial equipment (Goldman-sachs and company, 1999). While the downturn in e-commerce stock valuation in 2000 resulted in the failure of many e-commerce ventures, the growth in B2B e-commerce is still on track.



In 2000, the value of worldwide B2B internet commerce sales transaction surpassed \$433 billion, a 189 percent increase over 1999 sales transaction (Pastore,2001). The emergence of business on the internet brings a new set of challenges to coordinating supply chain activities .Firms conducting business electronically face several differences in the e- commerce business environment that may have significant impact on managing relationship in the supply chain.

While the categories under your direct control can usually be safely included under e-commerce, there is typically significant spend outside the procurement team's (and especially the e- Sourcing team's) direct control. For e-Sourcing devotees, the benefits of using e-Sourcing are well known. E-Sourcing has a long and proven history of providing improvements in savings, efficiency, cycle times, transparency and compliance but not much has related it to supply chain processes at South Nyanza Sugar Company Limited, <http://scanmarket.com/blog/top-5-reasons-people-dont-use-esourcing-and-how-to-overcome-the-obstacles/>

Youngok (2006) argued that “The trend worldwide has proved that information provision and delivery had shifted from the traditional models to electronic and web-based formats. Traditional collections are giving way to if not total but at least hybrid collections. This change in structure is not without its attendant challenges as electronic and digital methods come along with their peculiar characteristics despite sharing the same purpose of preserving, organizing and distributing information resources as in the case of traditional libraries it is considered efficient in enhancing supply chain processes. Though South Nyanza Sugar Company limited has implemented e-cataloguing, a study has not been conducted to gauge its effects on its supply chain processes.

Smart(2010) reported that, “From the late 1990s a number of independent e-tendering mechanisms were launched which offered potential benefits such as increased order accuracy, transaction efficiency and greater integration between trading partners. At the outset of this programme of research, e-tendering was therefore an emerging phenomenon with little academic research and presented an opportunity to investigate a largely unexplored area. The published articles focus on the impact of core applications within e-procurement, including online reverse auctions, electronic marketplaces, online catalogue sites, and buying systems

covering the 'requisition to pay' cycle. The findings from the papers address a number of core themes in purchasing management. In considering buyer-supplier relationships, it was observed that such dyads are driven by traditional buyer negotiation factors such as segmentation, power and price and that use of e-procurement applications tended to enforce such traditional behaviors. In relation to the potential for integration, the study found that integration between firms was barely affected, as the concept of integration was neither an objective nor a business case Driver for e-tendering implementation". In respect to South Nyanza Sugar Company Limited, not much has been done to gauge the influence of e-tendering on the supply chain processes.

1.2 Statement of the problem

With the advancement in technology, many production firms have found it an immense idea to digitalize their entire production system especially the procurement and sales departments. In order to remain relevant in the competitive market, firms have to be committed to implement efficient and effective computerized systems to enhance interaction between the firms and their customers who include suppliers and consumers of their products. In its endeavor to enhance performance, South Nyanza Company Limited had initiated an elaborate project of digitalizing its core functions like e-sourcing, e-cataloguing and e-tendering. However, with such noble initiatives, not much has changed in terms of improving their supply chain processes. Many suppliers and customers have reportedly complained about inefficiencies of goods flow, imbalanced information flow, slow rate of material flow and low customer relations. This research is therefore designed to study the effect of e-commerce implementation on supply chain processes in South Nyanza Sugar Company Limited



1.3 Objectives of the study

The main objective of the research was to study the effect of e-commerce implementation on supply chain processes in South Nyanza Sugar Company Limited.

The specific objectives were:

- I. To establish the level of influence of e-sourcing on supply chain processes in South Nyanza Sugar Company Limited.
- II. To establish the level of influence of e-cataloguing on supply chain processes in South Nyanza Sugar Company Limited.
- III. To establish the level of influence of e-tendering on supply chain processes in South Nyanza Sugar Company Limited.

1.4 Research questions

1. What is the level of influence of e-sourcing on supply chain processes in South Nyanza Sugar Company Limited?
2. What is the level of influence of e-cataloguing on supply chain processes in South Nyanza Sugar Company Limited?
3. What is the level of influence of e-tendering on supply chain processes in South Nyanza Sugar Company Limited?

1.5 Scope of the Study

The study was conducted at South Nyanza Sugar Company Limited. The company operates in Migori County which is bordering Tanzania to the South, Homa Bay County to the north and Kisii County to the west. The study covered both e-commerce implementation and supply chain processes as the main concepts. The study was conducted for a period of four months.

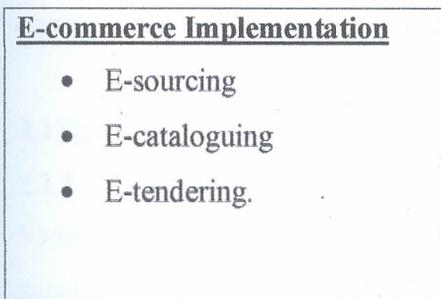
1.6 Significance of the study

The study will be significant to the learning institutions if the findings could be used to educate learners on the application of the Electronic Commerce in the SCM

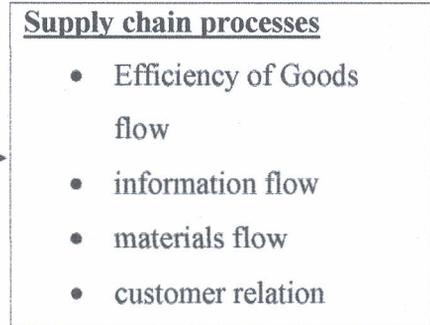
Besides, the findings would be useful to the company in assessing the level to which e-commerce has influenced its Supply Chain Processes and thereafter make appropriate decisions.

1.7 Conceptual framework

Independent Variable



Dependent Variable



Self conceptualization (2014)

The conceptual framework above depicts the theoretical relationship between e-commerce implementation and supply chain processes. E-commerce implementation was the independent variable with e-sourcing, e-cataloguing and e-tendering as the main forms of e-commerce. Supply chain processes were the dependent variable with its dimensions being efficiency of goods flow, information flow, material flow and customer relation.

Theoretically, e-commerce is believed to cause supply chain processes by affecting in cases where e-commerce implementation has been successful.

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CHAPTER TWO

LITERATURE REVIEW

This chapter reviewed both theoretical and empirical literature on the implementation of e-commerce on the supply chain process

2.1 Theoretical literature review

2.1.1 Supply Chain Management

Supply chain is the flow of materials, information, money and services from raw material suppliers through factories and warehouses to the end customers-supply chain refers to a supply chain that is managed electronically, usually with Web technologies. A Supply Chain encompasses all activities in fulfilling customer demands and requests. These activities are associated with the flow and transformation of goods from the raw materials stage, through to the end user, as well as the associated information and funds flows (Elden, M. and Chisholm, R.F, 1993). There are four stages in a supply chain: the supply network, the internal supply chain (which are manufacturing plants), distribution systems, and the end users. Moving up and down the stages are the four flows: material flow, service flow, information flow and funds flow. E-procurement links the supply network and manufacturing plant, e-distribution links the manufacturing plant and the distribution network, and e-commerce links the distribution network and the end users.

Supply Chain Management (SCM) is a set of synchronized decisions and activities utilized to efficiently integrate suppliers, manufacturers, warehouses, transporters, retailers, and customers so that the right product or service is distributed at the right quantities, to the right location and at the right time, in order to minimize system-wide costs while satisfying customer service level requirements. The objective of SCM is to achieve sustainable competitive advantage.

SCM is therefore the process of managing the movement of goods from suppliers to buyers (Barber, N. F. September 1997). SCM (SCM), also known as supply chain integration or supply chain optimization, is the process of optimizing a company's internal practices in interacting with suppliers and customers in order to bring products to market more efficiently. SCM functions encompass demand forecasting, sourcing and procurement, inventory and warehouse management, distribution logistics, and other disciplines. The SCM procedure repeatedly succeeds where Enterprise Resource Planning (ERP) fails. In order to correctly forecast inventory levels, the SCM system needs ERP's database cooperation (Laudon&Laudon, 2002). A powerful SCM includes the systematization and optimization of needs to know from its suppliers the

timeline for putting the materials on the production line. On the other hand, the production timeline relates to the products' shipment date. Then those solutions extend to the customers and customers' customers and complete the business.

According to Choi et al 1997, E-commerce simply defined is any method of using electronic communications and computer technology to conduct business, but the most eye-catching developments of e-commerce are related to the internet. Ten years ago the internet world-wide had fewer than 3 million users and it had no applications involving e-commerce. By 2009, its usage had increased over 80-fold and around a quarter of these users were purchasing on-line to a value of around US\$110 billion. If this expected rapid growth continues by 2015, e-commerce transactions between businesses (B2B) and from businesses to consumers (B2C) will represent 5% of the transactions in each of the two sectors. These sectors constitute the key areas of development and progress. Overall the global internet economy could soon be worth about 5% of the world's GDP. This phenomenal growth of the World Wide Web has enabled it to be used both as a trading platform and as a SCM (SCM) concept. The nature of the trading platform may simply represent an advertisement facility or, at the other extreme, be an interactive site through which consumers can shop or bid at auctions at a global level, resulting in close interaction of supply and demand. It is this trading platform usage that is usually referred to as e-commerce but the impact on SCM is also important, especially when considering its implications for transport.

E-commerce enables small companies to be involved in electronic transactions and thereby operate in a world-wide market.

The concept of electronic business transaction itself is at least 20 years old. Electronic data interchange (EDI) technology allowed large companies that could afford the investment in hardware and specific software to send messages to each other for placing orders and managing deliveries. Stock inventories could be cut significantly and Just-in-Time (JIT) ordering systems saved large sums on the cost of holding product components (Carter and Price 1995). For example, in the automotive industry EDI was extended across the entire supply chain to allow dealers to place orders directly with distributors who in turn ordered from manufacturers who in turn ordered from component suppliers. However, smaller businesses had little involvement in this as they did not have the volumes of transactions to justify the investment. In addition, the lack of standards in procedures, each one being specific to a particular system, meant that the cost of customization for EDI business was prohibitive for a small company. The internet has changed this completely. With web

browsers, there are now common standards for communication and widespread availability of client access software. This enables small businesses to operate in a world market. There are numerous examples of growing successes in the small business sector.

Chuang, M.-L. and Shaw, W. H (2005) argues that the open structure and low usage costs for the internet constantly; stimulate both new and existing information and communication technologies (ICT), thereby making it more and more possible for buyers and sellers to come together efficiently. The result is the creation of new marketplaces' and opportunities which themselves cause changes in product and service customization, search and location, distribution, and consumption.

2.1.2 E-commerce and making supplier contact

Another phase of Supply Chain, supplier contact, can be defined as the process of communicating with one or more suppliers after they have been deemed suitable. This communication may take the form of Requests for Quotation (RFQ), Requests for Bids (RFB), and Requests for Information (RFI) or direct contact with a supplier. Chopra, S. and P. Meindl (2001) reveals that the relative lack of trust within adversarial relationships is an important factor in the supplier contact phase. Instances in auctioning reveal the need for a communication audit trail between certain organizations due to lack of managerial support and lack of trust; both of which are clear indicators of an adversarial relationship.

Grover and Malhotra, (1997) reports that due to the nature of the adversarial relationships within any organization's auction, the supplier contact phase has become much more visible with the introduction of an audit trail. The shortage and surplus market is marred by fraudulent acts. With little or no supervision, personal relationships began to develop between some junior managers and buyers. This resulted in instances where goods were sold at very low prices as a result of the buyer providing 'incentives' to particular managers. Also low trust between the participants in the auction has led to buyers (especially large organizations) wishing to keep their identity anonymous in order to be quoted fairly.

2.1.3 Classification of E-commerce

There are several types of business methods in today's e-business scopes, such as "Business-to Consumer (B2C), Business-to-Business (B2B), Consumer-to- Consumer (C2C), Peer-to-Peer and Mobilfe, or m-Commerce" (Laudon&Traver, 2001, p. 13). E-commerce is often seen in terms of online purchasing or business to consumer (B2C) commerce, though this

activity is fairly small compared to business to business commerce (B2B). In 2008 for example, the former was worth perhaps 8 billion US\$ and the latter 43 billion US\$; predictions for 2013 are of the order of 108 billion US\$ and 1.3 trillion US\$, respectively. Although some B2B growth is due to the transfer of SCM (SCM) systems from the old EDI networks to the internet, it is also driven by the recognition by businesses that they can share information and work collaboratively with other businesses, and deal directly with suppliers, thereby not only reducing inventory costs in the process but promoting a more effective customer service as well. Sophisticated B2B systems encompass the entire supply chain by working with customers, manufacturers and suppliers.

According to Deitel, P. J. and Nieto T. R. (2001), related developments can also be seen in new businesses with new products and services that have emerged as a result of an e-commerce approach. Whether in B2B or B2C scenarios, this form of supply depends on improved information and understanding of consumer or business user requirements, and provision is moving from simply supplying a product more efficiently to tailoring an entire service that matches particular user requirements. The ever-closer provision of service and product requirements or their combination to meet particular needs of the user or consumer was an increasing feature of e-commerce supply. The e-commerce process can eliminate the usual industry practice of over-estimating materials that then get wasted. With e-commerce, what is ordered is used, and when there is a gap, it can be filled readily by electronic ordering combined with JIT delivery. This could lead to environmental benefits.

Cassivi, L. (2006) also argues that the third feature is the global aspect of e-commerce. E-commerce operates beyond national borders, and thereby brings together supply and demand at a global level. This feature may lead to changes in the structure of supply chains as global sourcing increases. In terms of business procurement, trading can be done with the best possible supplier, whatever their location, and the time needed to negotiate is reduced as a result of online transmission of documents and other communications. Therefore, it could be said that the development of ICT has enormous effect on conventional systems and, furthermore, to national competitiveness. Developing countries such as China and India and emerging markets in Asia are starting to use e-commerce techniques to improve footholds in world markets.

Attwood, R. (1998) argues that E-commerce uses advanced technology to assist business transactions in a web-based environment and facilitates the transaction of information flow and fund flow. E-commerce involves business-to-business transaction (B2B) such as

Covisint, business-to-customer transaction such as Amazon.com (B2C), customer-to-business transaction (C2B) such as priceline.com, and customer-to-customer transaction (C2C) such as e-Bay auction. E-commerce is conducted via a variety of electronic media. These electronic media include electronic data interchange (EDI); electronic funds transfer (EFT), bar codes, fax, automated voice mail, CD-ROM catalogs and a variety of others.

E-distribution instructs where to locate the sources of supply and advises how to access them, as well as how to move the materials to the retailers via the Internet or a web-based environment.

E-procurement is a part of E-commerce. E-procurement completely revolutionizes a manufacturing or distribution firm's supply chain, making a seamless flow of order fulfillment information from manufacturer to supplier [Bourassa and Richard (June 2001)]. Now we have characterized the nature of SCM, we are ready to make a few relevant points: The role of SCM is to produce products that conform to customer requirements; the objective of SCM is to be efficient and cost-effective through collaborative efforts across the entire system while the scope of SCM encompasses the firm's activities from the strategic level through the tactical and operational levels since it takes into account the efficient integration of suppliers, manufacturers, wholesalers, retailers, and end users. No matter which e-commerce business model is chosen, the SCM issues are impacted positively or negatively. Thus the relationship between the SCM issues and the e-commerce models is of qualitative nature. According to Albrecht et al, (2005) a particular choice of e-commerce business models, the quality of a supply chain with respect to a given SCM issue will improve, deteriorate, or stay constant. We take the approach of relative ordering in which, for a particular business model under analysis, the SCM issues that favour it are ranked higher than the ones that do not. Two special ranks need explanation. It is possible that an e-commerce model has no effect on or hinders an SCM issue. We give the lowest rank for models that are neutral with respect to an SCM issue Whitten, J. L. and Bentley, L. D. (2008). A model that hinders improving an SCM issue is given a high rank with respect to that SCM issue. Such a relative ordering saves us from giving exact score for a business model with respect to an SCM issue that might require significant work and can be resource-consuming.

Electronic Commerce enables organizations to create improved connections with trading partners and increase global competitiveness (Ngai and Wat, 2002). It has consequently spawned new business models and radically transformed existing ones (Wise and Morrison,

2000; Hayes and Finnegan, 2005) It is generally acknowledged that B2B accounts for the 'largest dollar volume of transactions' in e-Commerce (Albrecht et al, 2005). In particular, electronic procurement is changing the nature of purchasing (Telgen, 1998)

However, e-Procurement is not a totally new phenomenon. EDI applications have long been utilized by organizations as a foundation for close business relationships and Just In Time (JIT) operations (Kim and Shunk, 2004), and can be described as the first wave of e-Procurement systems (Chaffey, 2002). E-Procurement has made a fundamental impact on the nature of inter-organizational relationships (Roberts and Mackay, 1997). Internet technologies including

'Intranets' and 'Extranets' have been critical for electronic procurement by facilitating integration and coordinating across organizational boundaries (Grover and Malhotra 1997). Nevertheless, it has been noted that more research is needed on the influence that business-to-business relationships have on the successful use of e-Procurement systems (Knudsen, 2003). In particular, it has been argued that these issues are important as an organization's supplier base and relationships are a major source of competitive advantage (Dyer and Singh, 1998). Grover and Malhotra, (1997) states how E-commerce is now driving changes in SCM. It has two major influences: vertical integration between trading partners - both shippers and logistics service providers, and the appearance of completely new functions and companies. The former relates to information sharing, common planning, and exchange of existing functions by way of supply chain integration which is supported and driven by ICT and e-commerce. The main requirement is that the partners in the chain are sufficiently informed about each other's processes and mechanisms so that they can anticipate another's needs and operate near an optimum level. Technological advances support this process by bringing about improvements in information exchange [Chopra, and Meindl (2001)]. Firms making components or products required for shipment can* have up to the minute information on stocks and their usage for production and arrange for immediate replacement so that minimum amounts of stock are held on site.

According to de Boer et al, (2002) consequence of e-commerce development therefore is that information becomes more easily available to all partners in the supply chain. Threats come to those parties in the chain who have traditionally earned a living on their access to scarce information since the switch over to e-commerce may leave little room for them. Agents, freight forwarders, wholesalers, retailers, those concerned with logistics functions such as consolidation, storage, picking, and marketing will all face more and more competition from

e-commerce sales channels. This is described as disintermediation resulting in certain intermediation roles in the chain becoming redundant. On the other hand, in large markets such as transport, parties in the chain may have difficulty finding the information they are looking for or may not be able to handle it. It is this area that is opening up new opportunities with new roles in the supply chain filled by information brokers or informediaries.

2.1.3.1 Business to Consumer (B2C)

Butler, Steve (2001) argues that the B2C model can be easily seen from many web sites because it sells the products, information and service to consumers and gains the revenue. The B2C model involves a business selling directly to consumers via a web site. This direct selling is the main reason that companies create these web sites. Also from these web sites' revenue models, online businesses can be sorted into five different categories such as "advertising revenue model, transaction fee revenue model, subscription revenue model, and sales includes house rental web sites and job searching web sites. At these sites, consumers choose to pay different amounts of money in order to access different levels of the service and reach the information.

2.1.3.2 B2B e-commerce

B2B e-commerce is simply defined as e-commerce between companies. This is the type of e-commerce that deals with relationships between and among businesses [Butler, Steve (2001)]. About 80% of e-commerce is of this type, and most experts predict that B2B e-commerce will continue to grow faster than the B2C segment. The B2B market has two primary components: e-frastructure and e-markets. E-frastructure is the architecture of B2B, primarily consisting of the following: Logistics; transportation, warehousing and distribution (e.g., Procter and Gamble); Application service providers - deployment, hosting and management of packaged software from a central facility (e.g., Oracle and Linkshare); Outsourcing of functions in the process of e-commerce, such as Web-hosting, security and customer care solutions (e.g., outsourcing providers such as E-Share, Net Sales, iXL Enterprises and Universal Access); Auction solutions software for the operation and maintenance of real-time auctions in the Internet (e.g., Moai Technologies and Open Site Technologies); Content management software for the facilitation of Web site content management and delivery (e.g., Interwoven and Procure Net); and Web-based commerce

enablers (e.g., Commerce One, a browser-based, XML enabled purchasing automation software)

2.1.3.3 B2G e-commerce

According to Fairchild, and Peterson (2003), Business-to-government e-commerce or B2G is generally defined as commerce between companies and the public sector. It refers to the use of the Internet for public procurement, licensing procedures, and other government-related operations. This kind of e-commerce has two features: first, the public sector assumes a pilot/leading role in establishing e-commerce; and second, it is assumed that the public sector has the greatest need for making its procurement system more effective. 15 Web-based purchasing policies increase the transparency of the procurement process (and reduce the risk of irregularities). To date, however, the size of the B2G ecommerce market as a component of total e-commerce is insignificant, as government e-procurement systems remain underdeveloped.

2.1.3.4. C2C e-commerce

Consumer-to-consumer e-commerce or C2C is simply commerce between private individuals or consumers. Fairchild, A. M. and Peterson, R. R. (2003) further explained how this type of e-commerce is characterized by the growth of electronic marketplaces and online auctions, particularly in vertical industries where firms/businesses can bid for what they want from among multiple suppliers. It perhaps has the greatest potential for developing new markets. This type of e-commerce comes in at least three forms: Auctions facilitated at a portal, such as eBay, which allows online real-time bidding on items being sold in the Web; peer-to-peer systems, such as the Napster model (a protocol for sharing files between users used by chat forums similar to IRC) and other file exchange and later money exchange models; and Classified ads at portal sites such as Excite Classifieds and wanted (an interactive, online marketplace where buyers and sellers can negotiate and which features "Buyer Leads & Want Ads") Consumer-to-business (C2B) transactions involve reverse auctions, which empower the consumer to drive transactions. According to Jones and D. Roos. (1990), a concrete example of this when competing airlines gives a traveller best travel and ticket offers in response to the traveller's post that she wants to fly from New York to San Francisco. There is little information on the relative size of global C2C e-commerce. However, C2C figures of popular C2C sites such as eBay and Napster indicate that this market is quite large. These sites produce millions of dollars in sales every day.

2.1.3.5 M-commerce

V. Zwass, (2001) suggest that M-commerce (mobile commerce) is the buying and selling of goods and services through wireless technology-i.e., handheld devices such as cellular telephones and personal digital assistants (PDAs). Japan is seen as a global leader in m-commerce. As content delivery over wireless devices becomes faster, more secure, and scalable, some believe that m-commerce will surpass wire line e-commerce as the method of choice for digital commerce transactions. This may well be true for the Asia-Pacific where there are more mobile phone users than there are Internet users. Industries affected by m-commerce include: Financial services, including mobile banking (when customers use their handheld devices to access their accounts and pay their bills), as well as brokerage services (in which stock quotes can be displayed and trading conducted from the same handheld device); Telecommunications, in which service changes, bill payment and account reviews can all be conducted from the same handheld device; Service/retail, as consumers are given the ability to place and pay for orders on-the-fly; Information services, which include the delivery of entertainment, financial news, sports figures and traffic updates to a single mobile device.

2.2 Empirical literature review

2.2.1 E-Sourcing and Supply Chain Processes

According to Sourcing or purchasing Baca & Rudy (2000), the internal supply chain of the focal manufacturing firm includes sourcing, production, and distribution. of the company is responsible for selecting suppliers, negotiating contracts, formulating purchasing process, and processing order. Production is responsible for transforming raw materials parts or components to a product. Distribution is responsible for managing the **material** and finished goods inventory from the manufacturer to customer. Enterprise Resource Planning systems (**ERP**) integrate the entire company's information system, process and store data, cut across functional areas, business units, and product lines to assist managers make business decisions. As an IT infrastructure, ERP influences the way companies manage their daily operations and facilitates the flow of information among all supply chain processes of a firm.

According to Barratt, M. A. (2004), long-term business relations between companies have therefore become threatened and the procurement market has been thrown open to all

suppliers. This has had employment implications for production workers, office staff and middle management - further accentuated by greater opportunities for outsourcing by firms even of administrative functions such as personnel and finance, which are becoming increasingly practicable through the use of ICT. Companies can offer and operate business services in a way comparable to them being an internal unit within the purchasing company itself. Such impacts are at present unevenly distributed, being seen as relatively commonplace in the USA and less well-developed for example in Japan where a more fraternalistic business model is the cultural norm.

Lysons (2006), states that time and cost advantages of e-commerce brought about through order processing and logistics planning increase the emphasis on time-definite delivery. Therefore, patterns of distribution are also likely to change both globally and locally. In global e-commerce, the impact on air cargo is likely to be significant. As intercontinental transactions become more common, it is reasonable to expect that e-commerce segments will contribute to air cargo growth, in order to fulfill the global requirement for speed and bespoke delivery especially in B2B.

However, document transmission, which may eventually be siphoned off by the internet, stands out as a major uncertainty. Therefore, it is possible to conceive of two divergent impacts on transport: first, greater disaggregation of freight flows at the urban level, but second, greater consolidation of long distance consignments

2.2.2 E-Cataloguing and Supply Chain Processes

In Nageria, Oyeronke (2015) examined the challenges associated with cataloguing electronic resources in six randomly selected university libraries in Southwest Nigeria. A questionnaire was administered to current cataloguers and those who had worked in the cataloguing sections of the selected university libraries. A total of one hundred and ten (110) copies of the questionnaire were distributed, out of which a hundred were found usable for this study. A descriptive survey method was used and the data collected was analyzed using descriptive and inferential statistics. This study highlighted challenges associated with cataloguing electronic resources such as lack of adequate physical description of some electronic resources, inadequate workflow in cataloguing sections, copyright issues among others.

According to the Attwood, R. (1998), the goal of buying organisations in this situation is to leverage this competitiveness to get the best possible price from their supplier and leverage

the competitive market by facilitating a global reach for 24 hours a day, seven days a week. Also the ability of 'ensuring competitive bidding' shows that an organization is committed to getting the best price for its customers. The disadvantage of using such a cost-led approach is that suppliers can feel unfairly treated. This can be seen when buyers are trying to source products at very short notice. During these situations it is common practice for suppliers to massively increase the price of the product in retaliation.

Kalakota and Robinson (2000) asserts that the information gathering phase is the initial stage where an organisation goes in search for a supplier and 'gets a feel' for the market. The information gathering stage is deemed necessary when there is no established relationship with suppliers. The phase includes an initial procurement requirement definition and the conduct of preliminary market research. When a customer notifies the organisation about a need to buy or sell goods, the system immediately sends an email to the other registered member locations alerting them; this gives the customer an immediate base of suppliers or buyers. Surplus inventory suppliers are used to cut costs, reduce dependence and source products that are unavailable from its usual suppliers.

Archer and Yuan (2000) states that when procuring products from these suppliers the company's procurement system allows the creation of a substantial list of potential suppliers that can fulfill their requirement. This type of broadcast communication differs from the integrated and direct communication characteristic of collaborative supply relationships. Collaborative relationships studied are long-term, so there is little need for this phase within e-Procurement systems. In comparison, adversarial relationships have a bigger impact on the information-gathering phase of e-procurement systems as there is a need to constantly search for the lowest price in the market. As a result systems-based communication links with adversarial partners are not strong but the audience is much wider than the collaborative relationships.

2.2.3 E-Tendering and Supply Chain Processes

In Kenya, Barngetuny and Kimutai (2015) sought to investigate the effects of E-procurement on supply chain management performance in Elgeyo Marakwet County. The study was conducted on public entities in Elgeyo Marakwet County. The study was limited to eprocurement and supply chain management performance. The study adopted the use of questionnaires and interview schedules to collect primary data. The research also adopted descriptive design to collect the quantitative and qualitative data that describes the effects of

e-procurement and supply chain management. Qualitative data was analyzed through content analysis. Quantitative data was analyzed through the use of frequency distribution, mean scores and standard deviations. The study established a correlation between all the variables of the study and the independent variables.

According to Barber, (1997), E-Awarding phase begins with opening of tenders. After checking contents of tenders winning tender is selected. This selection can be automated provided that there are assigned weights to specific features of tenders (it is particularly feasible if the tenders are built on questions). The e-Procurement system can give just the recommendations and the last word belongs to the awarding authority. The chosen tenderer and rejected suppliers are informed on the results of the evaluation.

According to Balasubramanian, S. and Mahajan, V. (2001), **E-Catalogue** is the electronic catalogue of goods/services where a buyer can create his order and submit it to the supplier. They are usually based on the framework contract established between the buyer and supplier. They are very useful for repetitive orders of low value goods. Currently catalogues are built on different standards e.g. XML and many of them are not compliant with CPV (common procurement vocabulary).

In Nageria, Oyeronke (2015) examined the challenges associated with cataloguing electronic resources in six randomly selected university libraries in Southwest Nigeria. A questionnaire was administered to current cataloguers and those who had worked in the cataloguing sections of the selected university libraries. A total of one hundred and ten (110) copies of the questionnaire were distributed, out of which a hundred were found usable for this study. A descriptive survey method was used and the data collected was analyzed using descriptive and inferential statistics. This study highlighted challenges associated with cataloguing electronic resources such as lack of adequate physical description of some electronic resources, inadequate workflow in cataloguing sections, copyright issues among others.

Barngetuny and Kimutai (2015) sought to investigate the effects of E-procurement on supply chain management performance in Elgeyo Marakwet County. The study was conducted on public entities in Elgeyo Marakwet County. The study was limited to eprocurement and supply chain management performance. The study adopted the use of questionnaires and interview schedules to collect primary data. The research also adopted descriptive design to collect the quantitative and qualitative data that describes the effects of e-procurement and supply chain management. Qualitative data was analyzed through content analysis.

Quantitative data was analyzed through the use of frequency distribution, mean scores and standard deviations. The study established a correlation between all the variables of the study and the independent variables.

Kanyaratl and Ungul(2014) found out that major changes are currently taking place within purchasing functions of manufacturing firms. Purchasing is shifting its focus from daily procurement activities to long term, value-adding purchasing and supply chain initiatives. At the same time, it is responding to the challenges and opportunities of electronic procurement (e-procurement), which refers to the utilization of the Internet to buy and sell products and services. The responsibilities of purchasing have changed markedly over the last few decades, Purchasing focused heavily on the transactional elements of the procurement process. Purchasing was accepted as a support function that provides for the sourcing needs of other departments. The development of materials management and introduction of new manufacturing technologies in the 1970s brought pre- and post-production flows closer together. The manufacturing-purchasing interface strengthened, creating a need to align the buying cycle with production requirements. Purchasing started to create a „culture“ that could help it to attain a more proactive role in the company and start taking responsibility in product design and development activities.

In the USA, Croom and Brandon (2015) found out that the advent of the Internet as a business systems platform has been a catalyst for major changes in the operation and status of organizational procurement. Early e-procurement literature forecast significant improvements in procurement costs, an improving status of the purchasing function, and changes to the structure of supply markets. Our study seeks to evaluate the validity of these forecasts through the development of a structural model of the ‘e-procurement effect’. This model is intended to define the dynamics of the e-procurement process in an organization and provide a foundation for a research stream the transformational effect of e-procurement deployment. The article presents the evaluation of e-procurement implementation and operation from an eighteen month study of e-procurement deployment across nine UK public sector organizations. The article explores five key themes in e-procurement, namely system specification, implementation management, changes to organizational characteristics, changes in total acquisition costs, and changes to governance structures.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter highlights the research design and methodology used.

3.1 Research Design

According to Oliveira, A. (2001), Grounded theory methodology was chosen for this study due to its appropriateness for the research questions (determining "how") and the phase in the scientific process" (exploratory research of a new phenomenon). This study will therefore adopt a correlation case study design.

3.2 Population and Sample of the study

3.2.1 Population

The target population of this study was the 40 staff members drawn from procurement departments and heads of user departments of Sony Sugar Company Limited.

3.2.2 Sample and sampling techniques

The entire population of the population was utilized in the study since the population was deemed small.

3.3 Data and data collection

3.3.1 Data source

Both secondary and primary data sources were used in the study.

3.3.2 Data collection

Primary data was collected using structured questionnaires while secondary data was obtained through document review.

3.3.3 Pilot Test

The questionnaire was subjected to pilot test to five randomly selected respondents before final administration. The five respondents were given the questionnaires to fill in the presence of the researcher. The results were used to check on reliability of the research instruments.

3.3.4 Data Validity

Validity of the data was achieved by seeking the opinion of an expert in the study area by giving the instruments to an expert. He went through and scrutinized it so as to ensure that the instruments were worthy for use for the intended research.

3.4 Data Analysis

Data was analyzed using inferential statistics. Regression model below was used.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$$

Where: Y-Supply Chain Processes

$\beta_0, \beta_1, \beta_2, \beta_3$ are constants to be determined

X_1 - e-Sourcing

X_2 - e-Cataloguing

X_3 - e-Tendering

e-disturbance term assuming a normal distribution and constant variance.

3.5 Data presentation

Data was presented in form of tables.

CHAPTER FOUR
RESULTS AND DISCUSSIONS

This chapter outlines the results and discussions of the effect of implementation of e-commerce on supply chain processes in South Nyanza Sugar Company Limited.

4.1 Gender distribution in the company.

The gender distributed was gauged from questionnaire analysis.

Table 4.2: Gender distribution in the company.

Gender	Frequency	Percentage
Male	24	60
Female	16	40
Total	40	100

Among the employees interviewed, 60% were male while 40% were female. There was only two female in Tender evaluation committee, one in Orders preparation Department.

4.2 Data Sources and Description

This study used data on perception of the 40 employees which were converted using likert scale ranging between 0-5.

4.3 Descriptive Statistics

Table 4.1: Descriptive Statistics of the Study Variables

	Goods flow	Information flow	Customer relation	e-sourcing	e-cataloging	e-tendering
Mean	3.6	3.4	3.2	3	3.8	3.1
Median	3	3	3	3	3	2
Maximum	4	5	4	4	5	4
Minimum	1	1	0	1	2	1
Observations	40	40	40	40	40	40

Source: Research data, 2015

The mean of all the variables were positive with the highest value being 5 for information flow and e-catalogue and lowest being 0 in customers relation.

4.2 Regression Analysis

To determine the effect of e-commerce implementation on supply chain processes in South Nyanza Sugar Company Limited, regression analysis was conducted. Multiple regression

analysis helped in testing the level of influence of e-sourcing, e-cataloguing and e-tendering on supply chain processes in South Nyanza Sugar Company Limited.

As shown from the ANOVA table presented in Table 4.7, the F-test was highly significant ($F_{0.05; 4, 20}=8.8207$, $p<0.05$). This indicates that the hypothesized multiple regression models were statistically adequate. Thus, the observed R^2 was significantly different from zero and the multiple regression equation was a better predictor of supply chain processes.

Table 4.6: ANOVA Table

	Sum of Squares	Df	Mean Square	F	P value
Regression	151.038	3	7138.24	8.8207	0.000284
Residual	16345.2	37	809.26		
Total	43418.16	40			

a Dependent Variable: Supply Chain Processes

Since $p<0.05$ there it was concluded that there was significant relationship between e-sourcing, e-cataloguing and e-tendering and Supply Chain Processes in South Nyanza Sugar Company Limited. This means that implementing e-sourcing, e-cataloguing and e-tendering influence the Supply Chain Processes in South Nyanza Sugar Company Limited.

Table 4.7 Model summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.817	0.667	0.623	0.54223

a. Independent variables: e-sourcing, e-cataloguing and e-tendering

b Dependent Variable: Supply Chain Processes

Coefficient of determination explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of the variation

in the dependent variable i.e Supply Chain Processes that is explained by all the three independent variables (e-sourcing, e-cataloguing and e-tendering). The independent variables studied explain only (66.7%) of the effect of implementation of e-commerce on Supply Chain Processes in South Nyanza Sugar Company Limited. as represented by R^2 . This means that the other factors not studied in this research contributed (33.3%).

Table 4.8: Results of multiple regression analysis

Model	Unstandardizeds		Standardized		
	Coefficients		Coefficients		
	B	Std. Error	Beta	t	Sig.
2 (Constant)	5.31	.163		32.576	.000
e-sourcing	.231	.087	.543	2.655	.025
e-cataloguing	.121	.089	.221	1.359	.350
e-tendering	.249	.072	.209	3.458	.015

a. Dependent: Supply chain processes

b. Predictors: (Constant), e-sourcing, e-cataloguing and e-tendering on supply chain processes

Source: Research data, 2015

Table 4.8 indicates that e-sourcing ($\beta_1 = .231$, $p < 0.05$), e-cataloguing ($\beta_2 = 0.121$, $p < 0.05$) and e-tendering ($\beta_3 = .249$, $p < 0.05$) were found to be positive and significant predictors of Supply chain processes.

The regression equation therefore was modeled to be:

$$Y = 5.31 + 0.231X_1 + 0.121X_2 + 0.249X_3$$

4.2.1 Influence of E-Sourcing on Supply Chain Processes

Objective one sought to establish the level of influence of e-sourcing on supply chain processes in South Nyanza Sugar Company Limited. From the regression results, it was revealed that e-sourcing ($\beta_1 = .231$, $p < 0.05$) had a significant positive influence on the supply chain processes. This implies that a unit increase in e-sourcing led to .231 increase in Supply chain processes, meaning that when e-sourcing is implemented, there was a positive influence on supply chain processes.

This finding is consistent with those of Baca & Rudy (2000), who found out that the internal supply chain of the focal manufacturing firm includes sourcing, production, and distribution. of the company is responsible for selecting suppliers, negotiating contracts, formulating purchasing process, and processing order and those of. Production is responsible for transforming raw materials parts or components to a product. Distribution is responsible for managing the material and finished. The finding is not consistent with those of Archer and Yuan (2000) who found out that as a result, systems-based communication links with adversarial partners are not strong but the audience is much wider than the collaborative relationships.

4.2.2 Influence of E-cataloguing on Supply Chain Processes

Objective two sought to establish the level of influence of e-cataloguing on supply chain processes in South Nyanza Sugar Company Limited. From the regression result, it was found out that e-cataloguing ($\beta_2=0.121$, $p<0.05$) had a positive influence on the supply chain processes. This implies that a unit increase in e-cataloguing led to .121 increases in Supply chain processes, meaning that when e-cataloguing is implemented, there was a positive influence on supply chain processes.

This finding is consistent with those of Kalakota and Robinson (2000) who asserts that the information gathering phase is the initial stage where an organization goes in search for a supplier and 'gets a feel' for the market. The information gathering stage is deemed necessary when there is no established relationship with suppliers. The phase includes an initial procurement requirement definition and the conduct of preliminary market research. When a customer notifies the organization about a need to buy or sell goods, the system immediately sends an email to the other registered member locations alerting them; this gives the customer an immediate base of suppliers or buyers. Surplus inventory suppliers are used to cut costs, reduce dependence and source products that are unavailable from its usual suppliers. The finding is not consistent with those of Oyeronke (2015) who argued that there challenges associated with cataloguing electronic resources such as lack of adequate physical description of some electronic resources, inadequate workflow in cataloguing sections, copyright issues among others which hamper the positive influence it may have on the supply chain processes.

4.2.3 Influence of E-Tendering on Supply Chain Process

Objective three sought to establish the level of influence of e-tendering on the supply chain processes of South Nyanza Sugar Company Limited. From the regression result, it was revealed that e-tendering ($\beta_3 = .249$, $p < 0.05$) had a positive influence on the supply chain processes. This implies that a unit increase in e-tendering led to .249 increases in Supply chain processes, meaning that when e-tendering is implemented, there was a positive influence on supply chain processes.

This finding is consistent with those of Croom and Brandon (2015) who found out that the advent of the Internet as a business systems platform has been a catalyst for major changes in the operation and status of organizational procurement. Early e-procurement literature forecast significant improvements in procurement costs, an improving status of the purchasing function, and changes to the structure of supply markets.

The finding is not consistent with those of Barber, (1997) who argued that e-warding phase begins with opening of tenders. After checking contents of tenders winning tender is selected. However, e-tendering system can give just the recommendations and the last word belongs to the awarding authority hence making e-tendering not to have greater influence.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

Objective one sought to establish the level of influence of e-sourcing on supply chain processes in South Nyanza Sugar Company Limited. It was established that e-sourcing had a significant positive influence on the supply chain processes.

Objective two sought to establish the level of influence of e-cataloguing on supply chain processes in South Nyanza Sugar Company Limited. It was established that e-cataloguing had a significant positive influence on the supply chain processes.

Objective three sought to establish the level of influence of e-tendering on supply chain processes in South Nyanza Sugar Company Limited. It was established that e-tendering had had a significant positive influence on the supply chain processes.

5.2 Conclusion

Based on the finding of objective one that e-sourcing had a significant positive influence on the supply chain processes, it was concluded that the more the Company invested in e-sourcing the better the supply chain processes.

Based on the finding of objective two that e-cataloguing had a significant positive influence on the supply chain processes, it was concluded that the more the Company invested in e-cataloguing the better the supply chain processes.

Based on the finding of objective three that e-tendering had a significant positive influence on the supply chain processes, it was concluded that the more the Company invested in e-tendering the better the supply chain processes.

5.3 Recommendation

Based on the conclusion of objective one that the more the Company invested in e-sourcing the better the supply chain processes the management should invest more on e-sourcing.

Based on the conclusion of objective two that the more the Company invested in e-cataloguing the better the supply chain processes the management should invest more on e-cataloguing.

Based on the conclusion of objective three that the more the Company invested in e-tendering the better the supply chain processes the management should invest more on e-tendering.

5.4 Future Research Future

The study presented opens the door for future research to expand these findings. As a first step, the dimensions of e-commerce and their impact should be examined in greater depth by extending the sample to a larger number of firms to gain a richer understanding of the phenomenon. For example, does the impact on supply chain management differ based on the length of time in e-commerce? This study examined the phenomenon from the single-firm point of view. It would be interesting to explore the effect of e-commerce on supply chain relationship management from a dynamic perspective or perhaps an extended supply chain. Are other supply chain members' experiences the same as or different from those evaluated? Do factors such as company size, position in the supply chain, or characteristics of other firms in the supply chains play a role in the impact? These and other potential moderating or mediating factors should be included in the theory.

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