

# **AN ASSESSMENT OF THE ADOPTION OF E- PROCUREMENT APPLICATION SYSTEMS ON SUPPLY CHAIN MANAGEMENT ENVIRONMENT IN KENYA: A CASE OF ZAIN KENYA LIMITED**

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## **ABSTRACT**

Pushmaun and Alt (2005) described evaluation of e-procurement as major part of supply chain management, supply chains are traditionally supported by information technology with the implementation of Enterprise Resource Planning (ERP) and Manufacturing Resource Planning (MRP) systems in the 1980's Electronic Data Interchange (EDI) connections with supplies were established. Percy and Guilrupero (2008) defined e-procurement as a technology solution that facilitates corporate buying using the internet, is a business to business purchasing practice that utilizes electronic commerce to identify potential sources of supply, to purchase goods and services, to transfer payment and interact with suppliers. E-procurement is part of a broader concept called Information Technology (IT) which is American Heritage. It is also the development, installation of computer system and applications. Palmer, Gupta and Davila (2002) argued that online procurement (e-procurement) has been identified as the most important element of e-business operational excellence for large corporations. Joyce (2006) described the procurement function in business organization as increasingly important. Among the reasons are: increased levels of outsourcing, increased use of internet or e-procurement, great emphasizes on supply chain management, globalization and continuing efforts to reduce costs and increase quality. This paper seeks to find out the factors that have contributed to adoption of e-procurement in supply chain management, the kinds of e-procurement services that have been adopted, impact of e-

procurement, the challenges the organization are facing in adoption of e-procurement by Zain Kenya limited. The paper consequently undertook an inductive research in the form of a case study focusing on Zain Kenya Limited and the adoption of e-procurement application systems in its supply chain management in Kenya. The study utilized questionnaires to collect the necessary quantitative and qualitative data from the respondents for analysis using both qualitative and quantitative statistical methods. The study's population consisted of a total of forty (40) respondents drawn from the organization's senior management and procurement department. Twenty (20) respondents were from senior management while the other twenty (20) respondents were from the procurement department of Zain Kenya Limited. The research findings illustrated that Zain Kenya has adopted various e-procurement application systems including the use of procurement card; payment by e-invoicing; e-procurement system; electronic cataloguing; and electronic auctioning. It was also observed that the search for information was the main reason for adoption of e-procurement application systems at the company. Consequently, e-procurement application systems have increased the management's information and analysis capabilities. The findings also showed that e-procurement application systems have increased Zain Kenya's overall performance. In addition, the researcher generalized that Zain Kenya has adopted e-procurement application systems in most of its departments and the adoption of the new ideas has enhanced the overall performance of the organization. The

paper further outlines various conclusions and recommendations in relation to the studies research questions.

**Key Words:** *e-procurement application systems, supply chain management, Kenya, Zain Kenya Limited*

## **INTRODUCTION**

Direct procurement is one of the most frequently performed business activities. It encompasses all items that are part of finished products, such as raw material, components and parts (J. Gebauer, and A. Segev, 2001). Most organizations spend more than 30% of their income dollars on purchasing goods and services (Ibid, 1998). It is even possible that about 20% of an organization's purchases constitute 80% of the total purchase value (C. Nam, 2002). Suggested by its name, electronic procurement (E-procurement) is the application of electronic commerce in procurement. It involves the use of various forms of information technology (IT), such as e-mail (electronic mail), EDI (Electronic Data Interchange), and e-marketplace (electronic marketplace), to automate and streamline the procurement process in business organizations (L. De Boer, J. Harink, and G. Heijboer, 2002), improving efficiency and transparency and thereby reducing the costs of operation within and between businesses. Electronic procurement can result in significant changes and improvements in a number of areas, including internal and external communications, business transactions, as well as management of supply chains and alliances.

Electronic procurement was touted as revolutionizing the supply chain and offering organizations a vast number of advantages. Such type has caused business to focus on the supply function to a greater extent than previously. The savings promised were too good not to consider and many organizations needed to make these savings to stay competitive. Yet for all the advantages promised the adoption of electronic procurement systems is not happening as quickly as predicted. Some of the reasons given are that organizations are adopting a 'wait and see' approach (Davila, Gupta and Palmer, 2003), the complexity of the decision due to the variety of software programs (Osmonbekov, Bello and Gilliland, 2002); business processes require adopting a number of different business models (Subramanian and Shaw, 2002), and complexity in knowing how the market is going to pan out with high predications on the number of players that are likely to be bought out or go into liquidation. Also different industries have adopted online systems to a greater or lesser extent than other industries making industry characteristics an important component when considering the adoption process (Bartels, Hudson and Pohlmann, 2003). Due to the above issues most research concentrates on the barriers to e-procurement adoption. Very few studies have considered positive influences in the adoption process (Min and Galle, 2003; Dooley and Purchase, 2004).

According to Croom (2005) Supply chain management (SCM) is the process of planning, implementing and controlling the operations of the supply chain as efficiently as possible. Supply chain management spans all movement and storage of raw materials, work in process inventory and finished goods from point of origin to consumption. Croom added that supply

chain management is considered as the planning and control of the total materials flow. Interest in supply chain management has grown significantly since its inception in the 1980s. During this time it has been transformed from a primarily operational activity focusing in the early years on distribution or on supporting the firm's manufacturing objectives and is now recognized as a strategic concept which spans functions and crosses inter-organizational boundaries. Professionals involved in managing supply chains today make interventions in an increasingly extended range of activities in the value chain upstream, facing towards suppliers and downstream, facing towards customers. Over time, the supply chain has become a key factor in achieving both cost and service improvements and has assumed a more central role in the business planning of successful organizations (Christopher, 2005). Companies seeking to leverage the supply chain as a means to improved performance have increased the emphasis on developing closer relationships with suppliers, distributors or customers and there has been a consequent movement towards longer-term relational policies and a growth in partnering. This approach is based on the premise that a co-operative philosophy leading to more integration of processes and systems with firms in the supply chain creates greater network-wide efficiencies (Lambert and Cooper, 2000). This study built on previous studies of positive influences and developed a model of adoption of e-procurement application systems which encompassed: adopted e-procurement application systems as well as the factors influencing adoption of e-procurement application systems.

### **The Telecom Industry and Its Supply Chain**

According to a market research report by IRC (2006), telecommunications has become a highly dynamic sector which has been undergoing profound structural changes of a magnitude having few parallels with other industries in the US or the rest of the world. It is important to understand that for decades the telecommunications industry was anything but dynamic. It has a long history of very stable and predictable growth—predictable in the sense that growth has been largely dependent on the plans of the incumbent network operator to expand its embedded infrastructure. In the US, telecommunications companies were regulated by the Federal Communications Commission (FCC) and individual state public utility agencies, who determined prices and the rate of technology deployment. Although the basic telephone system was continuously being improved, such as through the transition from analog to digital switching, or the shift from pulse to touch-tone dialing, few major innovations could create new markets or replace existing ones. For the most part, the industry's newfound dynamism has been due to market deregulation, as well as a supply push created by new technologies entering the marketplace. The introduction of local services competition, new broadband access methods, computer/telephony convergence, and the explosion of wireless technologies led to heightened interest from inventors, entrepreneurs, and investors. As a result, the telecommunications industry has shown an economic growth rate in the mid-to-late 1990s which few other industries could match.

Beginning in the third quarter of 2000, the optimistic outlook of the e-business and communications sectors abruptly changed. There was a realization that Wall Street expectations for communications companies were becoming extravagant, and that credit and capital financing were a bit too easy to find. In addition, booked orders were excessive, business practices were lax, and inventories were allowed to grow to unacceptable levels. The failure of many dot coms, Internet service providers (ISPs), competitive local exchange carriers (CLECs), and data local exchange carriers (DLECs) led to declining demand for computers and networking infrastructure. The cutbacks forced established carriers like AT&T and MCI WorldCom to limit their own spending plans and set the stage for the current downturn (IRC, 2006). The current market perturbations are unmasking a profound structural change at the very core of the industry. Network deployment and service introduction strategies are determined by a number of factors, including subscriber demand, cost structure, economic environment, and the need for network modernization. Two general models exist for the deployment of services and technology infrastructure: The supply-push model; and the demand-pull model. In the supply-push scenario, technology is deployed in advance of high levels of market demand. The technology is made available in an attempt to stimulate market demand. This model assumes that end-users will find new and innovative uses for technology after it is deployed, and it supports a more rapid deployment of network technology based on the supplier's vision. The supply-push model, however, also creates risk for both the network operator and its stockholders. In the demand-pull scenario, technology is deployed only if it enables services that have proven demand, provides efficiencies, and/or reduces overall network operating costs. The demand-pull model results in slower deployment of technology and creates less risk for the network operator and its stockholders. In the long-run, however, dependence on the demand-pull scenario invites the entry of multiple competitors and leads to a loss of market share by the incumbent operators.

According to IRC (2006), over the past year, the telecommunications industry has seen a radical shift from the supply-push financing model to the demand-pull financing model. In short, we are currently in a global communications marketplace that is demand-driven, not supply-driven. The shift to a demand-driven procurement model will have a considerable impact on how network operators purchase products. In this market environment, achieving operational efficiencies and cost reductions has taken on new importance. There still is a great deal of complexity in the purchasing processes that service providers use. For example, a single purchasing agent within one of the operators may purchase telecom equipment from hundreds of suppliers. In the US alone, Insight estimates that telecom products and functional common components are supplied by over 1,000 manufacturers, distributors, and wholesalers.

The supply chain encompasses all the activities associated with moving goods from the raw materials stage through to the end user. The supply chain includes a variety of companies, ranging from firms that process raw materials to firms engaged in retailing and wholesaling products. Functions of these firms include procurement, production scheduling, manufacturing, order processing, inventory management, warehousing, and customer service. Supply chain

management (SCM) enables telecom equipment purchasers in fragmented markets to reduce procurement process inefficiencies. Purchasers can reduce their time-to-market pressures, improve their purchasing processes, and easily access current product specifications and information. Suppliers are able to post updated product data on bulletin boards, cost-effectively access global markets, and streamline their sales, marketing, and distribution channel operations (IRC, 2006).

### **Statement of the Problem**

Interest in supply chain management has grown significantly since its inception in the 1980s. During this time it has been transformed from a primarily operational activity focusing in the early years on distribution or on supporting the firm's manufacturing objectives and is now recognized as a strategic concept which spans functions and crosses inter-organizational boundaries. Professionals involved in managing supply chains today make interventions in an increasingly extended range of activities in the value chain upstream, facing towards suppliers and downstream, facing towards customers. Over time, the supply chain has become a key factor in achieving both cost and service improvements and has assumed a more central role in the business planning of successful organizations, (Christopher, 2005). Companies seeking to leverage the supply chain as a means to improved performance have increased the emphasis on developing closer relationships with suppliers, distributors or customers and there has been a consequent movement towards longer-term relational policies and a growth in partnering. This approach is based on the premise that a co-operative philosophy leading to more integration of processes and systems with firms in the supply chain creates greater network-wide efficiencies (Lambert and Cooper, 2000).

In an increasingly complex world of globalised trade with extended lead times and greater risk, this integration in the supply chain will require supporting information systems and technology. The growth of the internet and technologies which enable real-time information sharing such as inter-connected ERP systems, web-based EDI, electronic portals and online order processing systems, can potentially support the building of closer links with customers, suppliers and third-party vendors such as logistics service providers. In practice however, the progress towards such supply chain integration between firms has often been stalled by factors such as rival cultures, information technology deficiencies, lack of process alignment and other organizational legacies (Barratt and Oliveira, 2001; Akkermans *et al.*, 1999). Hence whilst this new technology offers much promise, examples of its success in transforming supply chain practice are still relatively few in number. A growth in case evidence on supply chain-related e-business projects will help our understanding of success or failure in achieving such "integration".

Structural changes driven by intense competition and globalization have led many telecommunication companies in Kenya to right size and outsource certain services including supply chain management. This has led to local studies on supply chain management. For instance, Mwanyota (2004) undertook a study dubbed "integrating supply chain management and

enterprise resource planning systems: a survey of supermarkets in Nairobi.” However, little empirical knowledge exists in the field of e-procurement application systems within the Kenyan telecommunication industry despite the implementation of various strategic decisions by organizations within this industry in Kenya. These decisions are made to cope with cut throat competition and also as an idea that has been brought about by the globalized economy. For instance, Zain Kenya in mid 2009 retrenched some of its labor force in a bid to increase efficiency and outsourced procurement and logistics services in an attempt to cut on the company’s costs through efficient supply chain management. Consequently, the researcher identified the organization as one of the organizations that have adopted e-procurement in its supply chain management in Kenya. As a result this study seeks to assess the adoption of e-procurement application systems in supply chain management environment; in order to fill the identifiable research gap relating to the kinds of e-procurement application systems adopted, impact of e-procurement on supply chain management and the challenges faced by Kenyan organization in the adoption of e-procurement application systems by undertaking a case study of Zain Kenya limited.

### **Research Aim**

The study aimed at developing a model capable of assessing the adoption of e-procurement application systems on the supply chain management of Zain Kenya Limited.

### **Specific Objectives**

1. To establish e-procurement application systems adopted by Zain Kenya Limited within the organization’s supply chain management environment.
2. To establish organizational factors determining adoption of e-procurement application systems by Zain Kenya Limited.
3. To examine technological factors determining adoption of e-procurement application systems by Zain Kenya Limited.
4. To establish environmental factors determining adoption of e-procurement application systems by Zain Kenya Limited.
5. To investigate challenges faced by Zain Kenya Limited in the adoption of e-procurement application systems.

## **LITERATURE REVIEW**

### **The concept of E-procurement**

Pearcy and Guilruperro (2008) defined e-procurement as a technology solution that facilitates corporate buying using the internet, is a business to business purchasing practice that utilizes electronic commerce to identify potential sources of supply, to purchase goods and services, to transfer payment and interact with suppliers. E-procurement is part of a broader concept called Information Technology (IT) which is American Heritage. It is also the development, installation

of computer system and applications. A wide variety of Internet-based technologies are available to firms attempting to improve their business position. (e.g. online catalogs, online auction). Internet based technologies vary in many respects including the ability to facilitate process, integration within and across firms. According to the American Heritage Dictionary (2005) is to “make into a whole by bringing all parts together to unify or to make part of a larger unit”. Some firms adopt technologies that involve application within a single function (e.g. electronic requisitions) while other use of e-procurement application that provide for process integration across multiple functions within a single firm (e.g. Enterprise resource planning systems (ERP) yet another use e-procurement applications that facilitate integration across organizations (e.g. electronic Data Interchange (EDI)). Smith and Correa (2005) related e-procurement and e-commerce whereby it is the development of market and auto-identification technologies which has created and enhanced business-to-business and its supply chain management procurement according to Smith and Correa improves the performance criteria of cost, quality, service, flexibility and reliability, it tracks and identifies goods in the supply chain (Buyer V/s Supplies), highly accurate information gathering through proper base data management system integration, minimize errors, reduce handling line and transport, greatly enhanced and accurate tracking in the supply chain as compared to traditional manual methods, it also reduces inefficiencies a long supply chain.

Pushmaun and Alt (2005) described evaluation of e-procurement as major part of supply chain management, supply chains are traditionally supported by information technology with the implementation of Enterprise Resource Planning (ERP) and Manufacturing Resource Planning (MRP) systems in the 1980’s Electronic Data Interchange (EDI) connections with supplies were established. They elaborated and said that e-procurement deals with the management of supply chains in the procurement of indirect goods that is based on internet information systems and also e-market. They identified benefits of e-procurement as to enable companies to decentralize operational procurement process as a result of higher supply chain transparency provided by e-procurement systems converting purchase requests into Purchase orders, ensuring the correct allocation of invoices received, its faster and efficient operational procurement process which by pass the purchasing department and enable those people to concentrate on more strategic tasks, enable requests to research for and select products in electronic catalogs which are authorized and negotiated by strategic procurement in advance and it enables companies to gain greater transparency over their procurement portfolio with the availability of more detailed data. E-procurement benefits fall into two major categories: Efficiency, which includes process, products and inventory savings and Effectiveness which is the proactive management of key data’s and higher quality purchasing decisions with organizations.

Lysons and Farrington (2006) described e-procurement as using the internet to operate the transactional aspects of requisitioning authority, ordering, receiving and payment process for the required service or product; it is typically the focus of local business administrators and covers the following areas of buying process: Requisition against agreed contract, authorization against



agreed contract, order, receipt and payment. The key enablers of all the above is the ability of systems to communicate across organizational boundaries.

Palmer, Gupta and Davila (2002) argued that online procurement (e-procurement) has been identified as the most important element of e-business operational excellence for large corporations. An e-procurement technology is defined as any technology designed to facilitate the acquisition of goods by a commercial or a government organization over the internet. E-procurement software, B2B (Business-2-Business), auctions, B2B market exchanges and purchasing consortia are focused on automating workflows, consolidating and leveraging organizational spending power and identifying new sourcing opportunities through the internet. E-procurement technologies have been credited with providing significant benefit to companies who venture into them. These advantages include: reducing administrative costs, shortening the order fulfillment cycle time, lowering inventory levels and the price paid for goods and preparing organizations for increased technological collaboration and planning with business partners.

Joyce (2006) described the procurement function in business organization as increasingly important. Among the reasons are: increased levels of outsourcing, increased use of internet or e-procurement, great emphasis on supply chain management, globalization and continuing efforts to reduce costs and increase quality. Among the purchasing responsibilities are obtaining materials, parts, supplies and services. Price, quality and reliability and speed of delivery are important variables. Purchasing selects suppliers, negotiates contracts, and establishes alliances acts as liaison between suppliers and various internal departments. It also is involved in value analysis, vendor analysis, make or buy analysis, supplier audits and supplier certification.

### **E- Procurement Application Systems**

Knudsen (2003) pointed out that E- procurement is not one single application but consists of many different tools; de Boer et al (2001) have identified and described six forms of e-procurement applications, and to them e- collaboration is added. The list is as follows: e-sourcing, e-tendering, e-informing, e-reverse auction, e-MRO, web-based enterprise resource planning (ERP) and e-collaboration. Each form of e-procurement is described regarding functionality and where in the procurement process it is located.

According to de Boer et al (2001) E-sourcing is the process of finding potential new suppliers using the internet in general or more specifically a B2B market place. Takes place in the information gathering step of the procurement process; E-tendering is the process of sending requests for information (RFI), request for the price (RFP), etc to suppliers and receiving the responses using the internet technology. The data concerned with e-tendering are focused on the product or service itself. Here, it is also possible to have an initial screening process where a number of suppliers qualify for the negotiation step. Takes place in the supplier contract step of the procurement process; E- Informing is a part of e-procurement that does not involve

transactions or call offs, but instead handles information about the suppliers regarding quality certification, financial status or unique capabilities. Supplier data can come from third party information providers and from a firm's own investigation into the suppliers; E-reverse auctions enable the purchasing company to buy goods and services that have the lowest price or combination of lowest price and other conditions via internet technology. The auction is most often traded in real time and ends in a closing bid between the buyer and the supplier. Takes place in the negotiating step of the procurement process; E-MRO and also web based ERP focus on the process of creating and approving purchasing requisitions, placing the orders and receiving the goods or service ordered using a software system based on internet technology. The difference between the two is that E-MRO deals with indirect items (maintenance, repair and operating materials), whereas the web based ERP deals with product related items. Takes place in the fulfillment step of the procurement process; E-Collaboration is correct and updated data regarding product versions, blueprints and sales forecasts are always available from the buying company's website or internet, thus reducing errors before they occur and making it possible for suppliers to be in sync with buyer: handles many gathering and disseminating of purchases related information. It also encompasses the usage of different collaboration tools such as virtual meeting rooms, bulletin boards, and even shared knowledge management systems.

### **Drivers of E-procurement**

Bright, Ibbotson, Ramsey, Boyd and Harrigan (2008) pointed out that The ever advancing capabilities of technology are an important driver of E-procurement implementation for the business. E-procurement can facilitate improved accuracy, reduced clerical work, reduced ledger- cycle time, and increased productivity (Heywood et al, 2002). Therefore, an important drive towards e-procurement adoption and implementation is the realization of the potential benefits that may be achieved (Minahan, 2001; Min and Galle, 2003). However, the adoption of new technologies, such as the Internet, by firms has often been proven to be reactive rather than proactive (Ramsey et al. 2003), where much depends on the power relationship in the supply chain. Coercion can be a driver, where a large organization or supply chain applies the entry barrier conforming to an e-procurement as a prerequisite for doing business. In other cases, the drive to implement e-procurement originates in the market place where market forces make it (E-procurement) necessary to compete. (Bartezzaghi and Ronchi; 2005).

For most organizations an information technology project represents a source of strategy. (Aldin et al, 2004). Although, much literature focuses on implementation in higher organizations sources may be more copious (Caghans et-al, 2003), organizations size is said not to be a major influence in e-procurement (Subramanian et-al, 2003; min and Galle, 2003). This can be attributed to the fact that e-procurement as a boundary-spanning activity implicitly involves supply chain integration (Mohmdno, 2003), which facilitates the pooling of resources amongst a range of organizations (Harris and Cohen, 2003) or supply chain activities whether it is for many or single applications.

## **The Concept of Supply Chain Management**

According to Croom (2005) Supply chain management (SCM) is the process of planning, implementing and controlling the operations of the supply chain as efficiently as possible. Supply chain management spans all movement and storage of raw materials, work in process inventory and finished goods from point of origin to consumption. Croom added that supply chain management is considered as the planning and control of the total materials flow.

Ethram (1991) viewed supply chain management as an alternative form to vertical integration and have defined it as the management of a net work of organizations or entities. One way of dealing with the diversity of definitions is to concentrate on some of the core processes and functions relating to the management of supply chains namely sales and marketing, fulfillment (i.e. logistics, warehousing and distribution) operations planning and procurement

Spina, Caniato and Caghano (2005) refer supply chain management as the management of different processes such as customer relationship management, customer service, demand management, order management, production of material flows and purchasing. In this light internet flows tools can be classified as e-commerce (support to sales, distribution and customer service processes), e-procurement (supporting sourcing, procurement tendering and order fulfillment processes), e-manufacturing (support demand and capacity planning, forecasting and internal supply chain integration. another classification is suggested that e-commerce, e-procurement and e-collaboration. The last category refers to the use of the internet to strengthen the relationships along the supply chain, exchanging data and making joint decisions. Classify web-based supply chain integration strategies according to two dimensions, namely internet-based demand and supply integration, the resulting categories are low integration, demand integration supply integration(similar to e-procurement) and demand chain management integration (which is joint application of the previous two strategies). More over, different tools and solutions have been implemented through the use of internet technologies each with different goals, benefits drawbacks for example differences exist between auctions, exchanges market places, catalogues, e-collaboration tools etc. finally distinctions between tools have also been made on the bases of connectivity between private and public tools.

Lankford (2004) explained that logistics management refers to the concept of an organization achieving greater goals related to efficiency, whether those goods are raw materials for manufacturing getting finished products to distribution centers, or forecasting with greater accuracy. Nearly all aspects of business from design through delivering to the customer can qualify in the same manner as being contained within supply chain. Management is to integrate many of the aspects of total quality management (TQM) that contribute to increase manufacturing efficiency and quality while reducing costs and maintaining the customer as at the ending station of the production line. it incorporates the goals of Just In Time (JIT) manufacturing in which producers maintain just enough raw material to produce only those goods that will be needed right away. Just in time depends on accurate forecasting and close

cooperation with suppliers to achieve success but pays off in less capital tied up in raw materials, finished goods that may or may not sell and the expense of storage.

Wang and Heng (2005) pointed out that supply chain management plays a role in influencing the economic behavior by the way inventory is managed. This in itself is certainly a very significant point, significant enough to make supply chain management one of the most important e-business topics for economists. Another point that deserves the attention of economists namely the contribution of the supply chain management to economic productivity by way of promoting more efficient production in the more general control texts for example, the presence of inventories encourages. Inefficient and work, results in too many defects and dramatically increases the amount of time required to complete the product. Inventory holdings can be used to cover up mistakes. Wrong items ordered defective manufactured parts thrown back into the storage space instead of being quickly fixed, indeed for every effort may be made to keep what is involved out of sight rather than uncovering error by liquidating stocks. In an economic growth cycle, we run the risk of stocking the flame of inflation. If there is no productivity gain, productivity gains can come in the form of technological innovation or other kinds of innovation. Supply chain management has two pronged contribution to productivity gains the contributions of supply chain management (SCM) to economic activity in themselves are sufficient ground for us to argue that e-business does contribute to economy and society.

### **The Importance of Supply Chain Integration**

Giurupero and Percy (2008) stated that the integration of key business. Process is essential to effective supply chain management and the extent to which e-procurement applications facilitate integration in an important focus of this study. the importance of integration in supply chain management (SCM) can only be fully appreciated with an understanding of how supply chain management has to be conceptualized. The term became very popular in the 1980s and interest in SCM on the part of academics and practioners has grown over last two decades. It was indicated that SCM involves the integration of business information flow and people. This described SCM as a process oriented, integrated approach to procuring, producing and delivering products and services to customers. finally defined supply chain management as “the integration of key business processes from end user through original suppliers that provide products and services and information that add value for customers and other stake holders while different definitions exist, it is clear that integration is a key aspect of supply chain management .

According to Giurupero and Percy (2008) Intra and inter firm integration of processes is imperative because it can increase the overall performance of individual firms and the supply chain. Internal integration in is achieved when firms effectively coordinate multiple processes on an enterprise wide basis. It was noted that the ability distinct functions working together seamless interfaces across processes is fundamental to the success of the firm and the supply chain is achieved integration across enterprises (external integration) firms must recognize the importance of supplies as a integral part of the supply chain visibility and operational efficiency

asserted that the advent and growth of various forms of IT (including e-procurement) has played a vital role in allowing supply chain members to achieve inter-firm coordination and integrate business processes. The use of IT has the potential to promote supply chain integration of providing efficient, timely and transparent business information to the appropriate parties. It should be noted that integration with and across firms alone does not guarantee improved overall supply chain performance. A key factor contributing to enhanced supply chain performance is strategic fit. A firm should seek to build supply chain capabilities (including the selection of various e-procurement applications) that support the overall corporate strategy without factors that impact supply chain performance. Decisions in the areas of facilities (location, number, capacity) inventory (economies of scale, ability to meet demand) and transportation (mode, network) while the use of e-procurement applications can assist firms achieving integration, it also has the potential to impede supply chain of coordinative and cooperative because they view this e-procurement application as a means for the buyer to extract price reductions, often to the detriment of their own profit margins, for example they found that under certain circumstances, the use of on time reverse auctions was significantly related to lack of supplier cooperation in assistance with designing process that reduce cost cycle time and time to market.

### **Relationship between E-procurement and Supply Chain Management**

Alt and Pashmain (2005) compared the internal focus of traditional logistic approaches and stated that, supply chain management (SCM) emphasizes the management of upstream and downstream relationships and role of supply chain optimization to increase customer value at less cost examples if supply chain management initiatives are just-in-time, zero inventory, efficient customer response, vendor-managed inventory or continuous replenishment. Supply chain management involves three areas to deal with order processing activities, physical activities and order related financial activities. The experience of many failed ERP implementations show that, the introduction of a new system is only efficient with design of existing business processes. Similarly the implementation of e-procurement system in isolation without considering the entire procurement process and systems involved will not be sufficient. Various e-procurement strategies need to be crafted in a company's procurement process according to their strength. Usually, they are complementary and support different parts of a company's procurement process.

According to Caputo, Branco and Michelino (2008) The increasing trends towards globalization and increased competitiveness across markets have meant that most business are looking to increase efficiency by addressing workforce levels and streamlining internal operations has been a favorite of many organizations. Business are now looking at the supply chain and procurement to provide additional efficiencies, strategically a superior supply chain increasing business responsiveness and competition will be "those companies that discard the traditional rules of doing business while working collaboratively with customers and supply chain partners to create

the future”. Integrating supply chains can yield substantial benefits for enterprises, from a 20-30% reduction in bottom-line goods and services cost to a 35% increase in market share.

Caputo, Branco and Michelino (2008) added that the clearest aspect of internet adoption is linked to performance improvements in terms of both effectiveness and efficiency. Processes become more transparent to the possibility of acquiring and sharing information in an easy and fast way. As well as the better coordination among players implies from a network point of view – mistakes and time reductions and contributes to the order and stock cuts. Nevertheless, the internet impact concerns not only operation management but it also affects the strategic dimension of supply chain (SC) design. The internet can enhance new business models development offering innovation opportunities and competitive advantage challenges. More than process efficiency improvements, it is important to underlie how the internet enables a deep rethinking of the whole business, suggesting new points of view. In this way there will be a structural change, in terms of both inter-firm works reorganization and roles rearrangement. The main idea is that the internet can support strategic activities such as integrated forecast, joint production planning, new product development, customer relationship management as well as operations like order cycle, stock and transportation management.

Lankford (2004) argued that many firms have improve both internal efficiency and quality management practices to the extent that additional cost reduction and quality improvements may offer little competitiveness advantage, increasing the speed of supply chain may be the best opportunity to reduce costs, improve productivity, decrease order cycle time and increase profits. Supply chain management may represent the single most effective tool that today’s business can employ to create competitive advantage in their markets. The battle for leadership in many business markets has shifted from company to one company’s virtual supply chain versus another. An effective supply chain requires integration collaboration, reliability, speed and flexibility to maximize both customer and supplier relationships while many strategies can be used to improve the performance of the supply chain, the growth in electronic commerce and internet usage has increased its importance.

## **RESEARCH METHODOLOGY AND DESIGN**

In this study, the researcher aims at assessing the adoption of e-procurement application systems within the supply chain management environment in Kenya. Consequently, the researcher found it most appropriate to adopt an inductive approach as this approach uses data to generate ideas as compared to the deductive method which starts with an idea or theoretical framework and uses the data to verify or disprove the idea. Hence, both qualitative and quantitative techniques were used. To acquire the necessary data, a case study research design was used as it allowed for descriptive cross sectional data collection and analysis aimed at assessing factors that influence adoption of e-procurement application systems in supply chain management environment by Zain Kenya Limited. This allowed for analysis of all relevant variables at the same time. Qualitative techniques were used for non-numerical descriptive data touching on aspects like e-

procurement processes, organizational and environmental factors influencing e-procurement application systems, and challenges faced in the adoption of e-procurement application system in the supply chain management environment. This was captured through the use of a semi structured questionnaire containing both closed and open ended questions. Quantitative techniques were also used in collection of numerical data including, but not limited to, the number of times e-procurement application systems were put into use as compared to the use of traditional procurement processes and procedures by Zain Kenya Limited. Descriptive research design was also used to describe the existing supply chain management environment, e-procurement processes and e-procurement application systems adopted by Zain Kenya limited. This research design was appropriate for this study since it leads to a profile development of a situation or a community by acquiring complete and possibly accurate information (Chandran, 2004) relating to the factors influencing the adoption of e-procurement application systems by Zain Kenya Limited.

To ensure reliability of the data collection instruments, a uniform questionnaire was used for all respondents within this study. The questions were framed in easy formats using simple and straightforward language to ensure universal understanding by all respondents. The questions were kept brief and to the point. The entire questionnaire was made short, timed to take a maximum of ten minutes of a respondent's time. Where possible and applicable, respondents were encouraged to get in touch with the researcher or his assistant for clarifications of certain questions; either through the telephone contact given on the questionnaire or personally. To ensure internal validity of the data collected, the researcher ensured that all the respondents within the organization understood and appreciated the essence and purpose of the study. This was done by getting managements buy-in towards the research to ensure full cooperation by their procurement staff in filling the questionnaire. Since all the respondents were situated within Zain Kenya's head office, less difficulty was experienced in distributing the questionnaires to the locations of the respondents. In collecting the data, the researcher physically dropped the questionnaires to the respondents and made follow-up using telephone calls. The respondents were encouraged to fill in the questionnaire accurately. The questionnaires were later picked from the respondents after the researcher was satisfied that they were correctly and accurately filled for the purposes of data analysis and reporting.

Mugenda and Mugenda (2003) describe data analysis as the process of data coding, data entry and the common methods used in data analysis. Both quantitative and qualitative data was collected for analysis. Once the data was collected, it was examined for completeness, consistency and reliability. Descriptive statistics techniques were used to analyze the quantitative data and they included frequencies, means, standard deviation and percentages. The qualitative data was then categorized, coded and descriptive statistics were used to analyze. Patton (1990) describes the process of categorization as one of constantly revisiting the logical explanation and the concrete data whilst looking for significant relationships. The coded data was then captured using a computer spreadsheet namely Microsoft Excel (MS-Excel) 2007. This package was used

to generate relevant charts and graphs helpful in interpreting the data. Graphs and pie-charts were used to present the data alongside excel generated tables. Additionally, further findings were presented within relevant thematic areas as per the objectives of the study. Using Ms Excel menus, average occurrences and responses were established using mean since it is easier to calculate and understand. The research questions were tested using the mean responses received by respondents. The unstructured opinion oriented question responses were analyzed and used in making summary and recommendations for the research findings.

## **RESEARCH RESULTS**

### **Demographic Characteristics of the Participants**

Findings indicate that majority (65%) of the respondents interviewed during the study were male. The remaining 35% were female. In this regard, one of the supervisors interviewed said that although Zain Kenya is gender sensitive in its recruitment policies, in the past it was mostly male applicants that applied for procurement positions whereas most senior managers were male within the organization, which explains the low number of female respondents reported in the study. During the study, it was found that 18% of the respondents had had formal education to the Diploma level, 47% were graduates holding a first degree, while 35% were university graduates holding more than the first degree.

Analysis showed that all the respondents had achieved professional training level, implying that they possess the expertise needed to perform the kinds of tasks they were employed to do. Further, it can also be observed that the majority (47%) of the respondents were trained as professionals to University level. This research finding illustrates that Zain Kenya has a highly trained and skilled team of management and procurement staff.

It has been argued that a highly trained team of workers is a great investment in any organization. Therefore, being the case at Zain Kenya, the level of education of the employees makes it easy to adopt institutional changes in terms of new technological innovations because the employees are easy to retrain and/or already have the background information on some of the technologies (e-procurement application systems) because they are employed on the basis of merit. It was also found that all the respondents that participated in the study had worked at Zain Kenya for at least one year.

Findings illustrated that the majority (68%) of the respondents had worked for Zain Kenya for between four and seven years. The remaining number of respondents (32%) had worked for the organization for less than four years. This research finding illustrates that they had experience at the Company. The experience was important to the study because it meant that the respondents could talk about issues on the adoption of e-procurement application systems out of personal experiences and thus, they were in position to provide substantive answers to questions raised in the study.



Findings illustrated that the senior management staff and middle level management staff represented 47% and 24% of the study's population respectively. Lower level management staff represented 29% of the respondents and that was mainly because they were all from the procurement department. The researcher deliberately targeted senior management and procurement staff as they are the ones deemed to possess the decision making power and work experience in relation to supply chain management and e-procurement application systems.

Overall, evidence from the foregoing discussion about the demographic characteristics of the respondents' shows that the background information was vital for the researcher in the sense that it ensured that the quality and reliability of the data collected was dependable as it was gathered from respondents with the relevant information, authority and work experience within Zain Kenya Limited.

### **E-procurement application systems adopted by Zain Kenya Limited**

The first research question of the study was "what e-procurement application systems has Zain Kenya Limited adopted within its supply chain management environment?" It is evident from the findings in Chapter 4 that the use of procurement card, payment by e-invoicing, and web based ERP are the most common forms of e-procurement application systems (technologies) adopted by Zain Kenya Limited. During data collection, it was found that these are transactions that directly involve customers' and dealers making payments and enquiries and their transformation into e-procurement application systems was meant to enhance effective service provision to customers. The market search was the second most used strategy in e-procurement. This was observed to be the trend in the telecommunication industry and the main reason as to why e-procurement is preferred in marketing was because Zain Kenya Limited serves a broad market: Kenya and the rest of East and parts of Central Africa. Therefore, the use of e-procurement application systems means ease of transaction and access to a wider local and international market. In terms of the electronic tendering process, the use of e-procurement application systems was applied on fifty-fifty basis because some of the actual procurement stages required the physical verification of transaction documents, which was not done manually. In other cases, the tendering process was done in the presence of each and every applicant so that transparency and accountability can be enhanced. Actual e-procurement auctioning and cataloguing were done, but on a minimal scale as compared to other procurement procedures and/or operations. This is because these are services that require physical presence and involvement of all the stakeholders. For instance, during auction of the company vehicles, all the potential buyers have to come physically and see the vehicles and also present themselves on the auction day.

These research findings are in line with literature reviewed that suggested the ever advancing capabilities of technology are an important driver of e-procurement implementation for the business (Bright, Ibbotson, Ramsey, Boyd and Harrigan, 2008). Heywood et al, (2002) pointed out that E-procurement can facilitate improved accuracy, reduced clerical work, reduced ledger-cycle time, and increased productivity). Therefore, an important drive towards e-procurement

adoption and implementation is the realization of the potential benefits that may be achieved (Minahan, 2001; Min and Galle, 2003).

The second research question was “which organizational factors influence adoption of e-procurement application systems by Zain Kenya Limited?” The research findings illustrated that the use of e-procurement was also a requirement in the telecommunication industry in Kenya and that is why the second majority of the respondents said that it was needed for approval in the industry. These research findings illustrate that Zain Kenya Limited was to engage in e-procurement both as a practice in the industry and also to keep put in terms of competition for the limited market. Some of the requisition requirements procedures are time consuming when conducted manually through the traditional paper procedures. Therefore, e-procurement application systems make it easy to serve many clients from the organizations market region/zone. E-procurement application systems are also used in delivering and tracking transactions. For instance, using e-procuring system, the company use a central system to keep a database for each client and it is easy to use such information to track operations in any region of operation and even when mistakes in transactions have been done, it is easy to correct using such information. This also limits fraudulent transactions and saves money on employing many employees to do the work manually.

The third research question was “which technological factors influence adoption of e-procurement application systems by Zain Kenya Limited?” It was observed that the level of simplicity or complexity involved is a key factor that influences the extent to which that particular technology can be easily adopted by the organization. For instance, it was found that some simple transactions cannot be carried out using e-procurement application systems because of the fact that they demand that the customer has similar technological gargets like high version computers and scanners, thus, discouraging using of such technologies because only a few people can access them. Financial benefit was another factor of concern. For instance, the cost of installation and use of e-procurement application systems, the initial investment cost needed to establish and network the system and the accruing income/benefits of the system are important factors of consideration in adoption of a particular e-procurement application system. The ease to use and share information using the technology was another factor of consideration illustrated during the study. For instance, when the technology can be adopted and supported by all phones including the simplest phones in the market, then it becomes easily adopted compared to those that require complicated phones for interface. Other factors include that ease to conceptualize the e-procurement technology at the business level; being difficult to understand and conceptualize the technology; the use of e-procurement for allowing organization for focus on strategic procurement activities. All these factors influenced the use of e-procurement application systems by Zain Kenya Limited. These findings are in line with literature reviewed that suggested for most organizations an information technology project represents a source of strategy (Aldin et al, 2004). This can be attributed to the fact that e-procurement as a boundary-spanning activity implicitly involves supply chain integration (Mohmdno, 2003), which facilitates the pooling of

resources amongst a range of organizations (Harris and Cohen, 2003) or supply chain activities whether it is for many or single applications.

The fourth research question was “which environmental factors influence adoption of e-procurement application systems by Zain Kenya Limited?” According to the research findings competition was a major environmental factor stated. One observation made from the research findings was that the main competitors/trading partners that adopted and used e-procurement application systems benefited greatly. Therefore, Zain Kenya Limited had to adopt e-procurement application systems in order to meet the demands and be consistent with what the competitors were doing in the marketplace. Moreover, significant pressure placed on Zain Kenya Limited to adopt e-procurement application systems by its parent organization and the fact that the main competitors/trading partners that adopted and used e-procurement were perceived favorably by suppliers, influenced the adoption of e-procurement application systems by the organization. Participation of organization in industry/government, trade, or professional associations was another environmental factor cited as being influential in the adoption of e-procurement application systems by Zain Kenya Limited.

The last research question of the study was “what are the challenges faced by Zain Kenya limited in adoption of e-procurement application systems within its supply chain management environment?” According to the research findings the tendering process was found to be one of the most critical tasks in the operations of Zain Kenya Limited. However, it was also the most controversial and most vulnerable to malpractices. Literature reviewed suggested that even if the benefits of adoption and the potential strategic implications of e-procurement are recognized, the list of impediments for an individual business includes items that are major potential barriers for an effective adoption: risk, uncertainty, inefficiencies from supplier and catalogue-content readiness, cultural change, staff resistance, need for firm wide training with likely disruption of on-going activities. Each one of these makes it difficult for firms to implement e-procurement strategies, to the possible extent that the implementation may be deemed too difficult. It has been argued that a firm that is not an e-procurement player now, most definitely will not be a major player in the future (Kiel 2000).

These findings can be interpreted to suggest that while there may be important first mover advantages for firms, there is no evidence sustaining such a prediction, especially in the case of Zain Kenya Limited. E-procurement is happening and has the potential to continue the creation of real value for all firms, even the laggards.

## **SUMMARY AND CONCLUSIONS**

One of the objectives of the study was to establish e-procurement application systems adopted by Zain Kenya Limited within the organization’s supply chain management environment. It was found that Zain Kenya Limited has adopted various e-procurement application systems including the use of an e-procurement card; payment by e-invoicing; electronic cataloguing; and electronic

auctioning. It was also observed that the search for information was the main reason for adoption of e-procurement application systems at the company. Consequently, e-procurement application systems have increased the management's information and analysis capabilities. Findings also showed that e-procurement application systems have increased Zain Kenya's overall performance. From the findings in objective one the researcher generalized that Zain Kenya Limited has adopted e-procurement application systems in most of its supply chain management environment and the adoption of the new ideas has enhanced the overall performance of the organization. This provides answers to the first research question which asked the types of e-procurement application systems that have been adopted by Zain Kenya Limited and their impact on the organization. On the basis of the findings in objective one, the researcher recommended that: Zain Kenya Limited should capitalize on e-procurement application systems that are easily accessible and compliant with less complex technological gadgets. For example, application systems that can be easily accessed through any basic mobile phone.

The second objective of the study was to establish organizational factors determining adoption of e-procurement application systems by Zain Kenya Limited. It was revealed that the employees concern about their job security and their potential to lose status were the main organizational factors behind the adoption of e-procurement application systems at Zain Kenya limited. Other factors included the participation of the senior management, customers demand for e-procurement application systems, and the desire to minimize risks. On the basis of the findings in objective two of the study, it was the researcher's generalization that the senior management at Zain Kenya supports the adoption and use of e-procurement application systems at the organization. This findings and subsequent generalization answers the study question number two, which asked about how the organizational factors influencing adoption of e-procurement application systems by Zain Kenya Limited.

The third objective of the study was to examine technological factors determining adoption of e-procurement application systems by Zain Kenya Limited. It was found that although the use of e-procurement application systems has facilitated information sharing, e-procurement technology is difficult and costly to mount and use in most cases. On the basis of the third finding, it is the researcher's generalization that e-procurement should be part and parcel of the organizational planning and policy so that adequate financial and information about the technology is disseminated in time in order to ease adoption of the same. To this regard, the researcher recommends that e-procurement application systems should be simplified where necessary so that it is affordable for both the company and its clients.

The fourth objective of the study was to establish environmental factors determining adoption of e-procurement application systems by Zain Kenya Limited. Findings indicated that the use of internet based technology by the competitors and the fact that those competitors that have adopted e-procurement application systems have benefited greatly resulting to increased profit earnings, were the main environmental factors that influenced the adoption of e-procurement

application systems adopted by Zain Kenya Limited. It was generalized that environmental factors play a significant role in influencing the adoption of e-procurement application systems by Zain Kenya Limited. Therefore, the adoption of e-procurement application systems by Zain Kenya Limited is facilitated by both internal and external factors within and without the control of the company.

The last objective of the study was to investigate challenges faced by Zain Kenya Limited in the adoption of e-procurement application systems. Research findings illustrated that a majority of the respondents were of the opinion that lack of financial resources and lack of awareness and knowledgeable of e-procurement application system were the most important factors in posing a challenge in the adoption of e-procurement application systems. The respondents also observed that the high cost or too expensive e-procurement application systems as well as lack of skills and literacy on e-procurement application systems to be adopted, were important in posing a challenge in the adoption of e-procurement application systems by the organization. It can then be concluded that inadequate financial resources as well as insufficient knowledge on e-procurement application systems are generally the major sources of challenges faced in the adoption of such application systems by Zain Kenya Limited.

In relation to the overall aim of this study which was to establish the factors influencing adoption of e-procurement application systems on the supply chain management of Zain Kenya Limited. The researcher acknowledges that it required a thorough understanding of the various research designs in order to enable him to select the most appropriate in answering the study's research question. Moreover, the researcher appreciates the work of other researchers and authors who have not only assisted in the advancement of human knowledge but have also developed research models and recommended data gathering and analysis techniques that have been useful in this study. The researcher also learnt to appreciate the vital role that research plays in the creation of knowledge and advancement of human learning both academically and in practice. However, a significant gap exists between research findings and the application and/or absorption of such findings into active practice by professionals. These gap needs to be filled through the publication and incorporation of new research findings in both academic curriculum and corporate training programs.

## **RECOMMENDATIONS**

The researcher found the following recommendations to be appropriate for the case of Zain Kenya Limited in the adoption of e-procurement application systems in its supply chain management environment. First and foremost, it would be appropriate for the organization to train the employees and suppliers on the importance of adopting e-procurement application systems by the organization i.e increase speed of the accessibility and dissemination of information, increase in productivity and other benefits as outlined by the research findings of this study. Secondly, it is important that the organization makes sure that the system is understood by the senior management, procurement staff and other users of e-procurement

application systems in the organizations supply chain management environment. Thirdly, senior management should address people resistance to change through strategic change management approaches as well as cultural change. Fourthly, suppliers to the organization should be connected to the company's supply chain through the adopted e-procurement application systems especially the market place e-procurement systems. This should be done mainly through the tendering process. Lastly, the organization should capitalize on e-procurement application systems that are easy access and compliant with less complex technological gadgets. These systems should be simplified where necessary so that it is affordable for both the company and its clients.

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