Survey to Examine the Drivers of E-Procurement in Public Hospitals in Kisii County, Kenya

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Abstract
Despite the many benefits of e-procurement including reduction in cost and procurement cycle time, more effective budget control, minimization on ordering and administrative errors, enabling originator to concentrate on strategic aspect of purchasing, decreasing the product price, enhanced information management, better payment process among others, it has been a bit difficult to identify them as either strategic, operational or tactical in nature. E procurement is a practice if adopted can lead to efficiency, transparency, reduction in costs among public organizations in Kenya. This underlined the need to carry out the study on the drivers of e-procurement I n Public Hospitals in Kenya. Like other public institutions, Public Hospitals have has not fully adopted e procurement and there for continue to miss the benefits. The purpose of the study was to examine the drivers of e-procurement in public hospitals in Kisii County. Specifically, to examine the operational benefits of e-procurement in public hospitals in Kisii county, to establish the tactical benefits of e-procurement in public hospitals and to establish strategic benefits of e- procurement in public hospitals in Kisii County. A survey research design was adopted. The study found out that specific strategic, operational and tactical benefits were drivers of e-procurement in public hospitals though in varying degree and a significant relationship existed between strategic, operational and tactical benefits and e-procurement in public hospitals. This study identified efficient purchasing system, reduced costs, increased process efficiency and strategic supplier relationships as the strongest drivers of e-procurement and therefore confirmed the null hypothesis. This study concluded that reduced operational and inventory cost enhances decision making, tactical benefits including a desire to shorten the procurement cycle drives e-procurement and that strategic benefits of e procurement in Kenya's public hospitals is highly dependent on the decreasing procurement cycle and the ability to enable greater flexibility for supplier selection The study recommended further studies in other variables that are not limited to tactical, operational and strategic benefit drivers. Future research need also to be carried in other public sector entities (corporations) in order to show if the link between e-procurement strategy and procurement performance can be generalized.
Keywords: e-procurement, public hospitals, procurement performance

1. Introduction

According to William (2003), supply chain management has exploded onto the business scene as one of the corporate management's major concerns over the past decades. This is because 70% of a firm's revenue is spent on supply-chain activities. As the world economies become competitive being sustainable does not depend on raising the prices rather on the ability of a firm to produce innovative products, of higher quality, and faster response time. These must be delivered in the quickest time possible at the lowest cost. Firms with the most competitive supply chains will continue to stay relevant and have a competitive advantage in contemporary business. The supply chain encompasses all activities associated with the flow and transformation of goods from the raw materials stage through to the end user, as associated information flows. Supply chain management is the integration of these activities through improved supply chain relationships to achieve sustainable competitive advantage. According to Smart (2010), the application which form the e-procurement landscape are designed to automate the buying cycle, optimize spend, improve process and workflow, support bidding and tendering and facilitate more effective search for products and services via the internet. Thomas and Rainer (2005), with the advent of internet, most of the organizations adopt techniques to streamline their indirect material supply chain; implementing e-procurement will result to substantial improved potential compared with paper-based procurement systems Aberdeen (2001), cited in Thomas and Reiner(2005) argues that by implementing e-procurement, operational process will be decentralized whereas strategic procurement process will be centralized which results in higher supply chain transparency.

David (2009) contended that e-procurement benefits falls into two categories: Direct cost reduction which is achieved by firstly increasing efficiency in procurement process. Process efficiency is defined as less employee time spending on searching, authorizing, approval and ordering; secondly enables to reduce number of staff which process each order by automatic validation of pre-approved budget for each person and each department and thirdly by decreasing printing cost and paper cost of order forms and invoices. Indirect benefits of e-procurement such as decreasing cycle time between order and delivery and enabling greater flexibility for supplier selection according to the best value. Kalakota and Robinson (2000), concluded that e-procurement is being considered as a strategic issue due to its great saving and cost reduction. Quality, flexibility, cost

efficiency and speed in procurement processes can be improved by utilizing new technologies such as internet and World Wide Web. According to David (2009), e-procurement enables buyers to spend more time on value-added activities by reducing his/her administrative tasks such as ordering and resolving difference between delivery and orders. Turban (2000), listed the benefits of e-procurement as follows: Reduction in cost and procurement cycle time, More effective budget control by limiting the expenditures and enhanced reporting, Minimizing ordering and administrative errors, enabling originator to concentrate on strategic aspect of purchasing, decreasing the product price, Enhanced information management, better payment process if it is integrated with e-procurement. The main purpose of implementing e-procurement is to expedite the operational procurement process bypassing purchasing department by permitting and entrusting more strategically task to requester. In e-procurement, the requester is able to search and select the product in approved electronic catalogs reducing inventory and staff time by implementing e-procurement will result to reduce the purchasing cycle time and cost. Thomas (2005), one of the important advantages of e-procurement is to reduce workload of purchasing company by decentralizing the operational procurement process. In traditional procurement processes many authorization stages were involved, these stages were reducing the speed and efficiency of procurement cycle by placing objection on request. To achieve faster and more convenient procurement process number of authorization stages should be decreased Atkinson (2001), announced that e-procurement advantages are precise and on time business intelligence, on time payment, better cash flow management, reduced administration cost and reduced overhead cost.

1.1 Statement Problem

The cost savings, improved contract compliance, time saving, reduces administration costs, enhanced market data, improved collaboration or visibility of the supply chain, reduced operating and inventory costs, on-line negotiated cost reduction, increased accuracy of production capacity, enhanced skill sets and standardized strategies as some of the benefits of e-procurement . Price reduction in tendering, negotiated unit cost reduction, improved visibility of customer demand, reduced administration costs, improved visibility of customer demand, reduced administration costs, improved market intelligence, reduced operational and inventory costs, enhanced decision making, improved contract compliance, shortened procurement cycle times, improved visibility of supply chain management, increased accuracy of production capacity, and enhanced inventory management were some of the drivers of e-procurement in Australia. According to Carayannis (2003) implementation of e-procurement governments can handle much of the administrative work automatically, thus making the procurement process more efficient than any present paper- based system, with a corresponding benefit from large cost savings. According to Edmiston (2003), previous literature has identified major advantages with e-procurement, such as, reduction of supply costs, reduction of cost per tender, lead time savings, simpler ordering, reduced paper work, decreased redundancy, less bureaucracy, standardization of processes and documentation, online reporting, clearer and more transparent processes, ensured compliance with procurement laws, and regulations, minimization of errors and easier access to information. Previous research also indicates that e-procurement may lead to increased quality and more adequate purchasing. Hawking et al (2004), further investigated the barriers to e-procurement in Australia identifying and ranking these in order of importance as inadequate technical infrastructure, lack of skilled personnel, inadequate technological infrastructure of business partners, lack of integration with business processes to support e-procurement, regulatory and legal confess security, cooperation of business partners, inadequate e-procurement solutions and upper management support. According to Thai & Grimm (2000), one of the most important challenges in government procurement is how to best utilize information technology in an age of communication revolution. According to Harrigan et al (2008) despite the various benefits offered by the use of e-procurement, organizations will meet a number of challenges when implementing such systems. Despite the benefits outlined above, Counties in Kenya have an inability to use the e-procurement system effectively. Tender management enhances transparency and effectiveness in procurement process. According to the Chairman, Kenya Council of Governors, the system breaks down, the internet is slow, and lack of enough accountants has made it difficult for county government to utilize the system. Based on these it is evident that e-procurement has got benefits as well as challenges.. Therefore this study examined the drivers of e-procurement in public hospitals in Kisii County.

1.2   Research Objectives

The specific objectives of the study were:
i.   To examine the operational benefits as a driver of e-procurement in public hospitals in Kisii county.
ii.   To establish the tactical benefits as a driver of e-procurement in public hospitals
iii. To establish strategic benefits as a driver of e- procurement in public hospitals in Kisii County.

1.3 Theoretical Literature

1.3.1 Institutional theory

According to Scott (2004), organizations comprises of cultural cognitive and regulative element that together with associated alternatives and resources give meaning to life. The theory is arched three pillars namely; regulatory, cultural and normative. The theory analysis regulatory pillar as enforcement means with experience as a basis for compliance. Cultural cognitive deals with beliefs, symbols and understanding while normative pillar refers to norms and values as the basis of compliance. In the context of the study of e-procurement of public hospitals is governed by public procurement rules and regulations. Referral hospitals, level 4 hospitals, health centers and dispensaries are recognized as public entities (Odhiambo and Kamau 2003).

1.3.2 Dialectical theory

The theory assumes that organizational entity exists in a pluralistic world of colliding forces or values that compete with each other for control and power (van de van & poole 1995). The oppositions may be internal to the organizational entity or external. This theory is used by van de van & poole (1995) to explain change in organizations as occurring when the opposing forces gain sufficient power to conform and engage the status quo.The emergence of e-procurement is the synthesis as the study states which at a later stage become the status quo and many again be controlled by an opposing force. However Van de ven $ poole (1995) warn that, the new synthesis is not necessarily project to a better state.

1.3.3 Agency theory

This theory explains the agency relationship in which one party (principle) delegates work to another (the agent) who performs the work (elsenhardt 1989). According to the study, the agency relationship encapsulates two types of problems; the goal of the principle and agent are often not the same and there exist information asymmetry between the principle and agent. Usually the agent possesses information that the principle lacks and hence it is difficult for the latter to check what the agent is doing. This theory is important for the study because e-procurement is conceived as an agency relationship. For instance in this study involving procuring by public hospital, a model can be constituted linking taxpayers, government, government agency (hospital) and suppliers.

1.4 Empirical Literature

Heywood et al. (2001) proposes that there should be three potential levels of benefit achievable from e-Procurement: transactions, focusing on e-enabling the purchasing process, strategic sourcing, using the newly aggregated control information to enable better and cheaper sources of supply, and market transparency, facilitating innovation and collaboration across the supply chain. As noted by Nelson et al. (2001), purchasing accounts for the majority of organizational spending. As such, the advent of web-based electronic procurement has been heralded as a "revolution" because of its potential to reduce the total cost of acquisition .The supply management and e-procurement literature is rich with estimates of the benefits of e-procurement. The potential is so great that e-procurement has turned the formerly looked-down-upon traditional purchasing function into a competitive weapon. The benefits that GE has realized from its TPN are illustrative. According to Aberdeen Group (2001) perhaps most impactful is the recent research by the Aberdeen Group that identifies the benefits that accrue to a firm from an e-sourcing strategy. In addition to the 5– 20% reductions in material costs, benefits include reducing sourcing cycle times by 25 – 30% and time-to-market by 10 – 15%. Cutting those cycle times has a significant impact on the revenue generation potential for the firm because products get to market faster, allowing the firm to position itself to capture market share from a first-to- market position. Overall, the Aberdeen Group estimates that cost savings from e sourcing could save U.S. firms approximately $690 billion.

According to Wyld (2002) a firm's asset base can significantly reduce inventory levels. An effective e-procurement strategy where, for example, extranets link the systems of buyers and suppliers over the Internet, facilitates real-time exchange of information in the buyer's production schedule. The supplier can then adjust its output to meet the changes in the buyer's demand. Of course, this implies that the supplier has developed capabilities allowing that degree of flexibility. Effective supply managers are aware that supplier development is one of the new basics of supply management. So, the issue of a supplier's flexibility is generally dealt with and resolved before the e-procurement strategy is put in place. According to Timme (2001) by some estimates, average inventory in the S&P industrial companies is $500 million or about 60 days of supply. Although different from company to company, the costs of carrying that inventory is in the 20 – 40% range. According to Dobler (1996) those carrying costs include the opportunity cost of capital, tax on assets, obsolescence and loss, storage costs, and insurance costs. The effects on a firm's costs from reducing the inventory component of the firm's asset base are obvious. According to Dell (1999) perhaps the best example is Dell Computer Corporation where ''disdaining inventory'' and ''trading inventory for information'' are among the firm's fundamental operating principles. The result has been inventory levels that have been slashed to less than 8 days or about 87% less than the average S&P industrial company. As Michael Dell notes: The link between day-to-day demand trend and the incoming material from your suppliers is absolutely critical to your success—so that the shorter you can make the link the better off you are. Today, we have access to technology that greatly facilitates that

information. We call this process-trading inventory for information. This linking of buyer and supplier not by inventory but by information is what Dell calls ''virtual integration.'' The information link is essential to any truly comprehensive e- procurement strategy. The vehicle that facilitates virtual integration is the Internet. According to Presutti (2003) Literature in the field of supply management and e-procurement discuss several benefits of e-procurement. In addition, e-procurement has been found to facilitate decentralization of procurement and, thereby, enable purchasing professionals to focus more efforts on strategically important issues.

According to Edmiston (2003) Previous literature has identified major advantages with e-procurement, such as; reduction of supply costs, reduction of cost per tender, lead time savings, simpler ordering, reduced paperwork, decreased redundancy, less bureaucracy, standardization of processes and documentation, online reporting, clearer and more transparent processes, ensured compliance with procurement laws and regulations, minimization of errors, and easier access to information. Previous research also indicates that e-procurement may lead to increased quality and more adequate purchasing. According to Carayannis (2003) implementation of e-procurement governments can handle much of the administrative work automatically, thus making the procurement process more efficient than any present paper-based system, with a corresponding benefit from large cost savings. Brousseau (1990) states that B2B marketplaces in the Internet could prove to be the most radical innovation in modern business since the assembly line were invented. Like beginning, e-procurement sites promise significant increases in productivity across many industries of the economy. Their most often quoted advantage is their potential to cut costs of purchased goods and services. The phenomenon of cost saving allowed by e-procurement is based on the new processes that cut all costs associated with purchasing, that is, the cost of goods and services purchased, ordering costs, and holding costs. According to Edmiston (2003) the availability and generally low cost of information and technology provided by Internet-based purchasing create absolutely different economics characterized by the following: Lower barriers for market entrance, better opportunities to avoid "maverick buying" and to use preferred supplier networks, better balance of power between seller and buyer.

According to DPWS (2002); DPWS (2001); Europe Economics (2001); DOF (2001). Securing value for taxpayers from this spend is clearly key concern. Implementing e-Procurement initiatives seem to deliver a significant contribution to this end. One of the main objectives of governments is to demonstrate the achievement of VFM in procurement. Her concern should be to extract the variables of the e- Procurement system that contribute to VFM in procurement. According to Europe Economics, (2001). VFM in this context is defined as "the optimum combination of whole-life cost and quality (or fitness for purpose) to meet the user's requirement". According to DOF (2001) theoretically, if a centralized e-Procurement system is applied to a government agency, VFM, and overall internal control, may be maximized by increasing the level of on-contract expenditure both within and across agencies by increasing agency compliance with contracts established under government policies (OGC 2002). According to OGC (2002) the e-Procurement tools can also facilitate assessment of VFM by providing internal process efficiencies, freeing up staff time to be spent on value-add activities. According to OGC (2003) aggregation of across-government contracts can assure that volume discounts will be obtained concurrently improving project management. According to OSD (2001) considering the "whole life cost" of the e-Procurement initiative, it can be argued that an element of VFM can also be achieved by reducing the Total Procurement Cost (TPC) of a project and by assessing the progress of the initiative in relation to budgeted expenditure (ROI) It is, therefore, important to associate the performance measures of the e-Procurement project itself to VFM improvement. Vaidya et al. (2002) state that he benefit of cost reduction through the implementation and deployment of the e-Procurement system can be related to Return on Investment (ROI) measures in the public sector. Although the term "Appropriation Efficiency Factor" has been coined as the public sector equivalent of e-Procurement ROI. According to AMS (2001), the term does not seem to be widely cited in the literature. Of course, a value-added service revenue model may not be relevant to all public sector agencies because the funding models apply only to a "whole-of government" approach to e-Procurement initiatives, which are being developed in some States of Australia. However OSD (2001); BuyIT (2002) say that a reduction in procurement processing time and cost and also the reduction in cost of goods and services procured will have a direct impact on ROI although this may be measured differently in public sector agencies. For example, a reduction in processing time through the transformation of paper-based process to online transactions should result in a reduction in processing costs. OSD (2001); OGC (2002); DPWS (2001) CGEC (2002) furthermore argue that the ability of the e-Procurement system to consolidate procurement volumes over time contributes to the reduction of cost of goods and services and thus the Total of Ownership (TCO)

According to OGC (2002). Apart from the cost reductions arising from transactional and price benefits that directly impact ROI, e-Procurement can also contribute to efficient purchasing process in many other indirect ways. As the workflow automatically routes information through the purchasing process without the need for data re-keying, the user can complete a requisition very quickly, easily and with a minimal amount

of data entry. According to DPWS (2001) reducing duplication reduces error rates and improves efficiency throughout the purchase to pay process. Streamlining of the internal processes enabled by e- Procurement results in improved delivery times, flexibility and reduction in process cycle times. Use of e-Procurement systems also offers increased ability to search for products and services, automated reordering systems, and access to a wider range of service providers Thus, it can be said that the ease of use, system availability and user friendliness together can contribute to positive user satisfaction.

According to OGC (2002) management Information (MI) can be extracted from the e-procurement system using standard reporting software OGC (2002), which makes the data collection process transparent. DOCITA (2000); OGC (2002) this transparency makes it possible to identify non-conformance and identify the necessary corrective action and improves ability to enforce compliance with procurement policy and procedures. According to OGC (2001) Sharing and analysis of procurement information facilitated by e-Procurement enables a more accurate estimate of the total spend on goods and services for a contract duration using actual historical spend data. Thus, both the better estimation and user compliance give suppliers' confidence that promised order volumes will be achieved. According to OSD (2001) In addition to contract compliance by the users, MI provided by e-Procurement also enables to monitor compliance with Service Level Agreements (SLA) and measure supplier performance.According to DOCITA (2000) An e-Procurement system has the potential to provide better procurement information by means of various customized reports allowing a complete visibility of the history of a transaction, automatically recording the 'who', 'when', 'what' and 'where' of every data entry on the system OGC (2002) of all purchasing activity and can reveal issues such as duplicated contracts, off-contract spend, and total spending patterns NEPP (2003); DPWS (2001). DPWS (2001) this enables management to better understand specific or critical issues in regards to procurement planning and have informed input into decision-making processes. In summary, management information that can be extracted from the e-Procurement system improves transparency, employee accountability, compliance, SLA monitoring and supplier performance measurement, which in turn, contribute to value for money improvement.

According to DPWS (2002) e-Procurement greatly helps improve communication with suppliers providing access to the latest information 24 hours a day, 7 days a week. Thus the maximum systems availability makes it easier for businesses to obtain tender documentation and to submit an offer. The general ease of information flow afforded by the Internet can help overcome many of the problems of geographic isolation, which can promote competition. According to AGV (2003) Although there seems to be a tension between "Buy Local" policies to boost the local economy and efficiencies to be achieved through purchasing from large suppliers, this type of tension can be resolved by other Government initiatives to help the regional and small businesses with the development and maintenance of their e-Catalogues in order to ensure equality of access. So, it can be said that enabling the suppliers with e- Commerce capability not only improves supplier relationships but also contributes efficiencies on the supply side reducing the suppliers' process costs (0CG 2002) which in turn, helps achieve the local and regional economic development.

According to Reddick (2004) there are several benefits achieved through the implementation of e-procurement practices. A government can lower its administrative costs associated with procurement by reducing the number of people and time associated with the procurement process. For instance, in a typical manual system, users would first have to find a supplier, obtain the appropriate paper catalogue, select the item, and seek and obtain management approval. After review and approval of the requisition by the procurement professional, a purchase order would be faxed to the supplier. This fax would be followed up with a phone call to verify receipt, and then copies would be sent to shipping and receiving, accounting and finance, and department managers. This paper-based system is sequential, prone to errors, encourages the carrying of excess inventory, and makes enterprise-wide integration very difficult. With e-procurement, the process is significantly different and more efficient. According to Gansler et al (2003) employees can access approved vendor catalogs from their personal computers, identify and compare needed items, and order them. Product availability and delivery information is readily accessible, and payments can be made electronically. Rule-based software can either provide automatic approval for routine orders or route the request to an available manager for approval. Costs for manually processing a purchase order range from $125 to $175. E-procurement can reduce those costs to $10 or $15 by eliminating faxes, phone calls, document preparation, and approvals. E-procurement can also significantly reduce the price of materials and supplies. Buyers can more easily identify the best value when they have access to more suppliers. This not only results in increased competition, but new visibility also creates opportunities for small businesses that were previously unavailable. Using online reverse auctions, buyers and sellers can quickly exchange information and bids, which often results in significant savings. Digitized transactions provide a complete, instantaneous, and far more accurate audit trail that allows management to track the status of orders, and identify and fix problems sooner. This data collection also allows organizations to monitor off-contract purchasing, a significant target for cost-cutting improvements. These maverick purchases are out of compliance with the organization's volume purchase agreements. According to Holden et al (2003) the use of the Internet to deliver all government services is a significant barrier because of the digital divide.

According to However, this barrier is not as much of a problem for e-procurement, as all vendors and government procurement officers have access to the Internet (Thai et al, 2000). According to GAO (2001), small business owners, however, feel that they are disadvantaged in the e-procurement process because of their lack of technical expertise and education on the government's multiple procurement Websites. According to MacManus (2002) one of the most serious inclusive issues facing government procurement officers today is the minority business owner's digital divide. As many large sized businesses use the Internet, minority entrepreneurs (many small business owners) are struggling to harness the power of information technology and e-procurement. According to The General Accounting Office (2001) did a study of the General Services Administration "GSA Advantage!" system. This is a multivendor Internet-based purchasing site, sometimes called an "electronic mall". This is where government buyers can search listings, compare prices, and purchase items online much as a private individual might purchase an item from an online retailer. The GAO report was a response to a concern from small businesses about their participation in government online procurement programs. The report indicated that in terms of contract dollars awarded small businesses successfully participated in online procurement programs such as Advantage. According to Neef (2001), officials from organisations representing or working with small businesses still report that they face obstacles in conducting electronic procurement with government. The costs and benefits of e-procurement can be summarised. The positive aspects of e-procurement generally cited in the literature include the following: lowered transaction costs; faster ordering; greater vendor choice; more efficient and standardized procurement processes; more control over procurement spending (e.g., less maverick buying) and employee compliance; more accessible Internet alternatives for buyers; and less paperwork from fewer repetitive administrative procedures. According to Reddick (2004), the costs for e-procurement can be summarized as: technical complexity – privacy, security, standardization and so forth; legal issues such as Web information as a public notice, digital signatures for procurement documents; method of payment for potential initial developmental costs and operating costs; maintaining relationships with online vendors and application service providers; and the digital divide for small and minority owned businesses. The empirical studies on government e-procurement should also be mentioned.

2.0 Research Methodology

The study adopted a descriptive survey research design. Jackson (2002) defines survey as a method of collecting information by having respondents complete a questionnaire. This design deemed appropriate in testing the relationship between the different components of independent and dependent variables of e-procurement drivers (Saunders, Lewis &Thornhill, 2003). Primary data was collected using a questionnaire. The regression models adopted are:

$Y = E\text{-}PROC. = \alpha + \beta_1 SB + \varepsilon$ …………………………………………….................... (3.1)

Where Y = E-PROC. = e-procurement impact, dependent variable, α is a constant and β_1 is a coefficient, SB = Strategic benefits, an independent variable, and ε is error term

$Y = E\text{-}PROC. = \alpha + \beta_2 OB + \varepsilon$ …………………………………………….....................(3.2)

Where Y =E-PROC. = e-procurement impact, dependent variable, α is a constant and β_2, is a coefficient, OB = Operational benefit and ε is error term.

$Y = E\text{-}PROC. = \alpha + \beta_3 TB + \varepsilon$…………………………………………….....................(3.3)

Where Y =E-PROC. = e-procurement impact, dependent variable, α is a constant and β_3, is a coefficient, TB = Tactical benefit and ε is error term.

$Y = E\text{-}PROCU. = \alpha + \beta_1 SB + \beta_2 OB + \beta_3 TB + \varepsilon$…………………………………………….....................(3.4)

Where Y = E-PROC. = e-procurement impact, dependent variable, α is the constant and β_1, β_2, β_3 are coefficients, SB= Strategic benefits, OB= Operational benefit, TB= Tactical benefits and ε is error term.

3.0 Drivers of E-procurement in the Public Hospitals in Kisii County Kenya

The findings reveal that greater choice of suppliers, improved supplier relationship, enhanced image among suppliers and supplier satisfaction as strategic benefits drive e-procurement though to a varying degree. 94.1 % were in agreement that improved supplier relationship and greater choice of suppliers were cited as most strategic driver of e-procurement. Whereas 86% of the respondents cited enhanced image among suppliers, supplier satisfaction as a driver was cited by 82% of the respondents. Based on mean scores the drivers were ranked as; improved supplier relationship (Mean=4.45), greater choice of suppliers (Mean=4.39), enhanced supplier image (Mean=4.14) and supplier satisfaction (Mean=4.00). The variation among responses as measured by the standard variation was greater in respect to supplier satisfaction (SD=0.82462) as a strategic driver for e-procurement. These findings are congruent with Hawking and Stein (2004) who argued of e- procurement not only as a strategic player in the value chain but as a major driver in the extended supply chain. In regard to operational benefits forms as divers of e-procurement, 47.1% of the respondents were in agreement that efficiency in purchasing was a driver of e-procurement with over one half (52.9%) of them strongly in agreement. 68.6% of the respondents were strongly in agreement that time saving was a strong driver of

operational driver of e-procurement. There existed varying responses as regards reduced transaction costs operational form as a driver of e-procurement with 7% of the respondents expressing a disagreement opinion. In terms of mean scores, efficient purchasing (Mean=4.5294) and time saving (Mean= 4.5294) were ranked as the highest operational drivers for e-procurement respectively. Other forms were ranked as; increased order process efficiency (Mean=4.4902); paper cost savings (Mean=4.3529), improved inventory management (Mean=4.3137) and reduced transactional costs (Mean=4.3529). The variation among responses were in regard to reduced transactional cost (SD=1.03621) form of operational benefit driver for e-procurement. Although the findings of this study is in agreement with Balchin (2001) who argues that an e-procurement solution play a fundamental role in transition of procurement through reduced paperwork and redundant effort, improving productivity and lowering the cost of the purchasing process. Hawking and Stein (2004) have also argued that it enables companies to locate suppliers with the best prices and quality and help streamline negotiations and contracting. The findings reveal that tactical benefits forms of driver for e-procurement varied in degree. Ninety Eighty (98%) of the respondents were in agreement that consolidation of purchase orders as a tactical benefit driver of e-procurement. Respondents were also in agreement that a better understanding of the purchase order (94.2%) reduced admired buying (96.1%) were drivers of e-procurement. In terms of mean scores, a better understanding of the purchase order (Mean=4.5098) was ranked the highest followed by consolidation of purchase orders (Mean=4.4118) and reduced admired buying (Mean=4.3529). The variation among responses in regard to reduced admiring of the buying process (SD=0.55941) was smaller in comparison to a better understanding of the purchase order (SD=0.61229).

3.1 Strategic benefits and e-procurement impact

Hypothesis H₁: There is a significant direct relationship between strategic benefits as a driver and e-procurement in public hospitals in Kisii County, Kenya. For the purpose of testing hypothesis H_1, strategic benefit as a driver was framed as a function of the specific benefits including greater choice for suppliers, improved supplier relationship, enhanced image among suppliers and supplier satisfaction. These five strategic benefits were thus operationalized by asking questions suppliers and managers about the concrete actions illustrating these elements. Similarly, e-procurement impact was stated in terms of efficiency, effectiveness, competitiveness and transparency. In this section first correlation analysis was done on strategic benefits as a driver and impact of e-procurement followed by regression analysis. The purpose of these analyses was to determine whether there were strong or weak correlations between the elements of strategic benefits as a diver and impact of e-procurement. Normally low regression coefficients would indicate weak correlations between the independent and the dependent variables. It was for this reason that it was felt essential to compute correlation analysis to provide an indication of whether specific strategic benefits driver were indeed related significantly to impact of e-procurement. The correlation analysis was done for the four specific strategic benefit drivers and the results of the analysis are presented in Table 1

Table 1: Correlation Coefficient strategic benefits as a driver and e-procurement impact.

Variables	Correlation coefficients
Greater choice of suppliers	.016
Improved supplier relationship	.421[*]
Enhanced image among suppliers	.153
Supplier satisfaction	.596[**]

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

According to the Table 1 the results for correlation analysis for strategic benefit drivers and e-procurement were positively correlated. The scores show no negative correlation between any of the variables and e-procurement. The correlation between greater choice of suppliers as a strategic benefit and composite e-procurement impact was r=0.016. Correlation for improved supplier relationship with composite e-procurement impact was r= 0.421. Enhanced image among suppliers and supplier satisfaction strategic benefits correlated positively with e-procurement, with r=0.153 and r= 0.596 respectively. These findings indicate that there is a strong linear relationship between buyer/supplier collaboration strategy and e-procurement strategy as shown in Table. By focusing on relational exchange collaboration entails the activities that are undertaken faintly rather than unilaterally (Davenport, 2008) suggested that the requirements for effective collaboration are mutual objectives, integrated policies, joint decision making, information sharing of benefits and losses. For the objective of establishing the strategic benefit as a driver on the impact of e-procurement in the study, a three step procedure method was applied. First, a construct of strategic benefit driver was used, and then the responses were grouped into four dimensions. Likert scale responses to all the questions on specific strategic benefits driver were summed up to create the index for the construct of strategic benefit driver. Impact of e-procurement was also computed as an index of the sum of the Likert scale responses of all its measures.

The following mathematical model was used to get the results for the regression of e-procurement

impact on the construct of strategic benefits driver that are presented in Table 2

E-procurement impact = $a + \beta SB + e$;

Where i = 1 to 5, j = 1 to 5,   SB = Strategic benefit driver

Table 2: Regression Prediction Model Summary e-procurement impact and Strategic benefit drivers

Model Coefficient		Unstandardized coefficients		Standardized Coefficients		T	Sig.
		B	Std Error	Beta			
(Constant)		3.373	.689			4.894	.000
Greater choice of suppliers (X_1)		-.098	.128	-0.129		-.769	.446
Improved supplier relationship (X_2)		-.145	.130	0.185		1.114	.271
Enhanced image among suppliers (X_3)		.009	.184	.009		.047	.962
Supplier satisfaction (X_4)		.148	.141	.201		1.056	.297
Model Summary	R		R^2		Adj.R^2	Std Error Est.	
	.298[a]		.089		.009	. 58889	
Model ANOVA		Sum of Squares	Df	Mean Square	F	Sig.	
	Regression	1.550	4	0.388	1.117	.360[b]	
	Residual	15.952	46	0.347			
	Total	17.502	50				

a. Dependent Variable: Composite Performance

The findings in Table 4.8 reveal that improved supplier relationship (β =0.185), enhanced image among suppliers (β =0.009) and supplier satisfaction (β =0.201) positively influenced e-procurement impact. However, greater choice for suppliers (β = 0.129) negatively influenced e-procurement impact. The resulting model is expressed as:

E-procurement impact= 3.373-0.129X_1 +0.185X_2 +0.009X_3 +0.201 X_4

This model has an R coefficient of 0.298 and an F value of 1.117 whose critical level is 0.360. This means that the model could be used to predict e-procurement impact based on specific strategic benefits as drivers. The model has an adjusted r^2 value of 9, meaning that 9 percent of changes caused by e-procurement impact are accounted for by specific strategic benefit drivers with an estimated error of the estimate of 0.58889 and therefore fails to reject hypothesis H_1. The findings of this study are congruent with Kalakota and Robinson (2000) cited in David Caffey (2009) who found out the benefits of e-procurement as decreasing cycle time between order and delivery and the ability to enable greater flexibility for supplier selection according to the best value. Further, this study concurs with (Gebauer and Segav, 2001; Birks et al 2001) that e-procurement is considered as a strategic issue due to its great saving and cost reduction.

3.2 Operational benefits and e-procurement impact

Hypothesis H$_2$: There is a significant direct relationship between operational benefits as a driver and e-procurement in public hospitals in Kisii County, Kenya.   Operational benefit as a driver was framed as a function of the specific variables including time savings, reduced transactional cost, paper cost saving, increased ordering process efficiency, efficient purchasing and improved inventory management.

Table 3: Correlation Coefficients of operational benefits specifics as a driver and e-procurement impact.

Variables	Correlation coefficients
Time saving	.138
Reduced transactional costs	. 639**
Paper cost saving	.479
Increased order process efficiency	.223
Efficient purchasing	.231
Improved inventory management	.326

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

The correlations coefficients findings presented in Table 3 reveal that all the operational benefits specifics as identified had a positive influence on e-procurement impact. Reduced transaction costs (r= 0.639 p≤.05) was statistically significant. Similarly, paper cost savings (r=0.49), improved inventory management(r=0.326) and increased ordering process efficiency(r=0.223) positively correlated with e-procurement impact. E-procurement can also significantly reduce the price of materials and supplies. These findings are in congruent with Whicher (2006) who found out that buyers can more easily identify the best value

when they have access to more suppliers thereby increasing order process efficiency and purchasing process. This not only results in increased competition, but new visibility also creates opportunities for small businesses that were previously unavailable.

The results in Table 4 indicate that, e-procurement impact is positively driven by time saving(X_1), cost savings on paper(X_3), increased ordering efficiency(X_4) and improved inventory management(X_6). It is however influenced negatively by reduced transactional buying (X_2) and efficient purchasing (X_5). The resulting model is expressed as follows:

E-procurement impact= $2.407+0.076X_1 -.400 X_2+0.598X_3 +0.028X_4 -.069 X_5+0.337 X_6$

This model has an r coefficient of 0.587 and an F value of 3.859 whose critical level is 0.004. This means that the model could be used to predict e-procurement impact based on specific operational benefits as drivers. The model has an adjusted r^2 value of 25.5, meaning that 25.5 percent of changes caused by e-procurement impact are accounted for by specific operational benefit drivers with an estimated error of the estimate of 0.51053 and therefore fails to reject hypothesis H_2. These findings are in line with (Frohlich, 2002) that procurement cost reduction strategy issues such as requisitions, approvals, receiving and payment reconciliation affect e-procurement performance

Table 4: Regression Prediction Model Summary e-procurement impact and specific operational benefit driver

Model Coefficient		Unstandardized coefficients		Standardized Coefficients	T	Sig.
		B	Std Error	Beta		
(Constant)		2.407	.934		2.576	.013
Time saving (X_1)		.050	.114	.076	.436	.665
Reduced transactional cost (X_2)		.228	.106	.400	-2.150	.037
Paper cost saving (X_3)		.363	.089	.598	.4.063	.000
Increased ordering process efficiency(X_4)		..028	.136	.028	.208	.836
Efficient purchasing(X_5)		-.081	.156	-.069	-.523	.604
Improved inventory management(X_6)		.282	.116	.337	2.349	.019
Model Summary	R		R^2		Adj.R^2	Std Error Est.
	.587a		.345		.255	. 51053
Model ANOVA		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	6.034	6	1.006	3.859	.004b
	Residual	11.468	44	0.261		
	Total	17.502	50			

a. Dependent Variable: Composite Performance

3.3 Tactical benefits and e-procurement impact

Hypothesis H_3: There is a significant direct relationship between tactical benefits as a driver and e-procurement in public hospitals in Kisii County, Kenya. Tactical benefit as a driver was framed as a function of the specific benefits including consolidation of purchase order, better understanding of purchase orders and reduced maverick buying. This was correlated against e-procurement impact and the correlations are presented in Table 5

Table 5: Correlation Coefficients of specific tactical benefits as a driver and e-procurement impact.

Variables	Correlation coefficients
Consolidated purchase order	-.050
Better understanding of purchase order	.278
Reduced maverick buying	.193

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Specific drivers of tactical benefits were correlated with composite e-procurement. The findings reveal positive correlation of a better understanding of purchase order (r=.278) and reduced maverick buying(r=0.193). The findings further indicated that consolidations of purchase order(r=-.050) correlated negatively with e-procurement impact.

Table 6: Regression Prediction Model Summary E-procurement impact and Tactical benefit driver

Model coefficient	Unstandardized coefficients		Standardized Coefficients	T	Sig.
	B	Std Error	Beta		
(Constant)	4.190	.894		4.685	.000
Consolidated purchase order(X_1)	-.079	.183	-0.072	-.431	.668
Better understanding of purchase order (X_2)	-.026	.150	-0.027	-.171	.865
Reduced maverick buying (X_3)	.113	.173	.107	.650	.519

Model Summary	R	R^2	Adj.R^2	Std Error Est.
	.101[a]	.010	.0085	.60715

Model ANOVA		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	.177	3	.059	.160	.923[b]
	Residual	17.35	47	0.369		
	Total	17.502	50			

a. Dependent Variable: e-procurement impact

The results in Table 6 indicate that, e-procurement impact is positively driven by reduced maverick buying (X_3). It is however influenced negatively by a better understanding of purchase order(X_2) and ability to consolidate orders as drivers of tactical benefits (X_1). The resulting model is expressed as follows:

e-procurement impact= $4.190 - 0.072X_1 - 0.027X_2 + 0.107X_3$

This model has an r coefficient of 0.101 and an F value of .160 whose critical level is 0.923. This means that the model could be used to predict e-procurement impact based on specific tactical benefits as drivers. The model has an adjusted r^2 value of 8.5, meaning that 8.5 percent of changes caused by e-procurement impact are accounted for by specific tactical benefit drivers with an estimated error of the estimate of 0.60715 and therefore fails to reject hypothesis H_3.

3.4 Combined strategic, operational and tactical benefits as drivers of e-procurement in public hospitals in Kisii County.

Hypothesis 4: The combined strategic, operational and tactical benefits as drivers of e-procurement in public hospitals in Kisii County are greater than the effects of each variable. The correlations are presented in Table 7

Table 7: Correlation Coefficients of combined benefits as a driver and e-procurement impact.

Variables	Correlation coefficients
Strategic benefits	.209
Operational benefits	.346*
Tactical benefits	.427**

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

The findings reveal significant positive correlation of, tactical benefits ($\beta = .247$; $p \leq .05$) and operational benefits ($\beta = .346$; $p \leq .05$) with e-procurement impact. It has also a positive but statistically significant relationship with strategic benefits ($\beta = .209$; $p \leq .05$).

Table 8: Regression Prediction Model Summary e-procurement impact and strategic, operational and tactical benefit drivers

Model coefficient		Unstandardized coefficients		Standardized Coefficients	T	Sig.
		B	Std Error	Beta		
(Constant)		3.116	.941		3.311	.002
Strategic benefits (X_1)		.306	.183	.284	1.676	1.00
Operational benefits (X_2)		.367	.187	.296	1.965	.055
Tactical benefits (X_3)		-.412	.247	-.298	-1.694	.097
Model Summary	R		R^2		Adj.R^2	Std Error Est.
	.374[a]		.140		.085	. 56606
Model ANOVA		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	2.4422	3	.814	2.541	.068[b]
	Residual	15.060	47	.320		
	Total	17.502	50			

a. Dependent Variable: Composite e-procurement impact

The results in Table 8 indicate that, e-procurement impact is positively influenced by indicators of strategic benefits (X_1), and operational benefits (X_2). It is however influenced negatively by drivers of tactical benefits (X_3). The resulting model is expressed as follows:

e-procurement impact= 3.116 +0.284X_1 + 0.296X_2 -0.298X_3

This model has an R coefficient of 0.374 and an F value of 2.541 whose critical level is 0.068. This means that the model could be used to predict e-procurement impact based on strategic, operational and tactical benefits as drivers. The model has an r^2 value of 8.5, meaning that 8.5 percent of changes caused by e-procurement impact are accounted for by strategic, operational and tactical benefit drivers with an estimated error of the estimate of 0.566 and therefore fails to reject hypothesis H_4. Although the findings of this study concurs with literature (Edmiston ,2003; Reddick ,2004; Turban et al ,2000) which identified major advantages with e-procurement such as; reduction of supply costs, reduction of cost per tender, lead time savings, simpler ordering, reduced paperwork, decreased redundancy, less bureaucracy, standardization of processes and documentation, online reporting, clearer and more transparent processes, ensured compliance with procurement laws and regulations, minimization of errors, and easier access to information. Panayiotou et al (2004) has noted that the inhibiting factors affecting the adoption of e-procurement in the public sector includes the complexity of goods/services procured, the need for transparency in procurement, the challenges posed by public policy and the regulatory and legal constraints faced by public sector organizations.

4.0 Recommendations of the Study

From the above conclusions, the following recommendations were arrived at: First, the variables of this study were drivers of e-procurement that is strategic, operational and tactical benefits. These variables were rather limited and not exhaustive. This study therefore recommends future research involving different sets of elements of these study variables. Secondly, the primary data analysis used was multiple regression analysis. This type of analytical approach has a number of limitations which may result in only in partial correct conclusions. It therefore recommends that future studies uses chi-square or F-tests for model goodness of fit.

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