

DETERMINANTS OF SUCCESSFUL IMPLEMENTATION OF E-PROCUREMENT IN PUBLIC INSTITUTIONS IN KENYA

Lagat Dorcas Chebii

PhD Student, Department of Management Science,
School of Business and Economics, Moi University, Kenya
dclagat@gmail.com

Abstract

The purpose of the study was to assess the determinants of successful implementation of e-procurement in Public Institutions in Kenya. The study determined the effect of technology, government support and supplier responsiveness on successful implementation of e-procurement. Questionnaires were used to collect data from 244 employees who were directly involved in the procurement practices in the Kenyan State Corporations. Data was analyzed using descriptive statistical and Inferential statistics such as Pearson correlation coefficients r and multiple regression models were used. Multiple regression analysis was employed to test the hypotheses. The study found out that technology, government support and supplier responsiveness have significant effect on E-procurement implementation. The study also established that technology is instrumental in enhancing e-procurement implementation. It is therefore utmost necessary to computerize most of the functions in the procurement department. Also, technology needs to be adopted to ensure proper functioning of the procurement system. There is also more evidence from the study showing that government support has role in e-procurement implementation.

Keywords: Technology, Government Support, Supplier Responsiveness, E-Procurement, Implementation, Procurement System

INTRODUCTION

A procurement system is a vital component of a company's Supply Chain system. Typically, a company's procurement function is subdivided into strategic and operational processes since activities and priorities in these two areas are entirely different (Kaufmann, 2009). Further, e-Procurement can be used in conjunction with the varied technologies of electronic commerce

such as document imaging, workflow management, bulletin boards and e-mail to enable business process reengineering. With these combinations, e-Procurement can give rise to a number of benefits to an organization and to the strategic position of a firm. It will help to consolidate purchasing practices that will lead to greater discounts and better service from suppliers. It also accelerates the flow of important information between the buyer and supplier, reduce administrative hours, thus freeing the workers to do other work and respond quickly to highly competitive new market entrants (Dong *et al*, 2009).

A number of public sector agencies worldwide have identified Electronic Procurement (e-Procurement) as a priority of e-Government agenda and have implemented or are in the process of implementing buy side e-Procurement systems (Vaidya *et al.*, 2006). However, the scholarly evaluation of e-procurement initiatives, especially in relation to the use of e-Procurement in supply chain management is very limited (Birks, Bond & Radford, 2001; DOF, 2001; CGEC, 2002). A review of e-Procurement literature, primarily from the last five years, shows a lack of core constructs around CSFs. The reason for this might be that implementation of e-Procurement initiatives in the public sector is still in the early stages.

Tonkin (2003) argues that there was little history of extensive use of e-Procurement in the public sector and therefore, the academic literature covering public sector adoption of e-Procurement and its effect on supply chain management is limited. Kenya has been undergoing reforms starting with the Public Procurement and Disposal Act 2005 that saw the creation of Public Procurement Oversight Authority. The next step was the implementation of e-procurement for the public sector. According to e-government strategy paper 2004, e-procurement was one of the medium term objectives which were to be implemented by June 2007, but the process has been very slow. The manual processes are costly, slow, inefficient and data storage and retrieval is poor (Akinyi, 2010). There is need to have a robust automated procurement system which is interlinked and this will lead to enhanced competitiveness and lowered costs (Ogotet *et al.*, 2009). Studies have attempted to find out the factors influencing the adoption effect of e-procurement (Huiet *et al.*, 2011; Lysons and Farrington, 2006; Weele, 2005). Leung (2007) has evaluated information sharing on e-procurement; he has not given emphasis on determinants of e-procurement implementation. Limited studies have been done to establish the effect of Supplier responsiveness, government support and technology on e procurement. Therefore this study was undertaken to establish critical success factors on e-procurement in the Kenyan State Corporations. As such this paper hypothesized that:

H₀₁: Technology has no significant effect on successful implementation of e-procurement

H₀₃: Government support has no significant effect on successful implementation of e-procurement

H₀₃: Supplier responsiveness has no significant effect on successful implementation of e-procurement

REVIEW OF LITERATURE

Theoretical Review

This study was drawn from Technology Acceptance Theory (Davis, 1985) and The Innovation diffusion theory (Rodgers, 1995). Technology Acceptance Theory explains the computer usage and acceptance of information technology. It is argued that computer usage helps in the understanding of adoption of new technology in public sector settings (Aboelmaged, 2010; Wahid, 2010). Although the theory suggests perceived usefulness and perceived ease of use as critical antecedents to users' technology adoption process, those models are not specific on the implementation of a new technology such as e-procurement system. Our theoretical framework draws on Croom & Brandon-Jones (2007), which is found useful to understanding key challenges of e-procurement implementation in government sector.

Empirical Review

Gunasekaran and Ngai (2008) stated that barriers in the system influence the successful adoption of e-procurement. Thus, identifying such barriers is critical in developing the right pathway for the adoption of e-procurement for the organizations. The barriers can be from infrastructure, strategy, people, culture, etc. As Walker & Harland (2008) said, In order to explain differences in e-procurement adoption between organizations, there are five main types of factors that appear to influence the adoption of e-procurement which are organizational, readiness, supply, strategic and policy factors.

Anyango (2005) asserts that companies are re-engineering their supply chain management software for example, the demand of e-procurement is pushing organizations to use their internets, and e-commerce to help them re-engineer their relationship with their suppliers, distributors and retailers to meet their e-commerce customers imperative needs to what they want, where and when it is wanted at the best possible cost. E-procurement has revolutionized and its effects on purchasing practices have improved in various businesses. The companies offering e-procurement systems have generated a considerable cost saving, productivity and efficiency.

Mathane (2007) on Factors Influencing Adoption of E-procurement in the Supply Chain states that the time taken for the acquisition by use of e-procurement is very important. The system should have the time that is taken to acquire goods or to exchange information through the supply chains. For this is much effective system of managing these chains. Chepkonga

(2010) on Factors Affecting Order Placement in Procurement Process observed that lead time depends on a number of factors, from the time it takes to create the machinery to the speed of delivery system. Lead time can be reduced if information technology is implemented on order placement and also introduction of online shopping.

Anyango (2005) on Factors Affecting Effectiveness of IT on Procurement Function stated that the use of IT in managing procurement function has developed rapidly over the last 10 years. Research demonstrates that IT has been utilized in a variety of procurement application including the communication with vendors, checking vendor price quotes and making purchases from vendor catalogues. Vendor negotiations have also been streamlined through the use of IT. It is being used in order processing applications. The most frequent areas of application include order placement and order status. Use of IT in order processing has resulted in increased accuracy levels and increased reliability.

Serem (2005) on Effects of Computerization of Kenya Ports Authority, stated that the successful going live of phase one of the IT strategy was a major milestone in the organization strategic road map and resolve to become an e-port and rated amongst top twenty ports in the world by the year 2000. The introduction of computers have witnessed and experienced drastic change in their working system. This includes less paperwork and decision making that has improved due to availability of online and timely information and service delivery to internal and external customers which used to take up to two days, now takes two minutes (Ibid). Reduced movement of staff, that is, a letter can be edited and e-mailed without sending by post or use of a messenger. Also the internal messaging service has reduced paper flow substantively and eliminated independent connections to external internet service providers which used to cost the authority Kshs. 140,000 per month.

Erasto (2005) on The Role of Vendor Managed Inventories in Customer/Supplier Chain states that the vendor managed inventory process is a combination of e-commerce, software and people. The e-commerce layer is the mechanism through which companies communicate the data. The vector markup language (VML) data can be communicated via electronic data interchange where compatible customer/supplier software and hardware are interlinked or any other reliable communications method. The key feature of the e-commerce layer is that data is timely and accurate. Chebii (2006) stated that the internet has opened the door to new ways of shopping. Shopping in the internet offers convenience way and time saving benefits to shoppers as compared to traditional way of shopping. This mode of shopping eliminates the agony of traffic jams, pick pockets and bad weather to travel and no transport cost is involved.

Wangare (2005) on Top Performance through E-procurement revealed that, top performers conduct more than 20% of their procurement online while they use the internet for

several e-procurement applications such as communicating with vendors, checking vendor price quotes and purchasing from vendor catalogues. The internet has also enabled companies to set early warning, damage system provide information on warranty agreements and assist in vendor negotiations. E-procurement functions must guard and mitigate risks, understand the market, build good relationship with the supplier who meets needs in a timely manner and constantly monitoring performance to improve service provision. This therefore raises the need for an organization to have clearly defined policies that can be understood (Ibid).

Wanyama (2012) on Contribution of E-procurement in Enhancing Procurement Process states that, application of IT helps to ensure a continuous production and distribution of goods and services in an organization. It guarantees on timely delivery and this creates a real life environment between buyer and supplier. Due to inadequate skills of employees in computer operation, it is very important to train them for the purpose of good management and organizational performance.

METHODOLOGY

The study adopted Explanatory research design. A census survey was utilized to select the target respondents for the study. Questionnaires were used to collect data from 244 employees who were directly involved in the procurement practices in the Kenyan State Corporations. Reliability assessment of internal consistency of the items was determined using Cronbach alpha coefficient. According to (Sekeran, 2003; Ventura *et al.*,2013; Waithaka *et al.*,2014; Cooper & Schindler, 2001), the general reliability coefficients around 0.9, was considered excellent, values around 0.8 as very good and values around 0.7 as adequate (Nunnally,1978). Quantitative data was analyzed using descriptive statistical method; the statistical tools such as mean, mode and standard deviation were used. Inferential statistic such as Pearson correlation coefficients r and multiple regression model were used. Multiple regression analysis was employed to test the hypotheses.

ANALYSIS AND RESULTS

This covers data analysis, presentation and interpretation of the findings. The study established that majority 68.1% (147) of the respondents have no training on e-procurement while only 31.9% (69) of the respondents have received training on e-procurement. Since majority of the respondents lack training on e-procurement, they are unable to understand its use hence unable to embrace e-procurement.

Descriptive Statistics and Validity and Reliability Results

The researcher sought to establish the technological aspect in e-procurement performance. The results are as shown in table 1. As evidenced in the table, 83.3% (28) of the respondents affirmed that the use of technology is highly recognized by the national government (mean = 4.67, SD = 0.97). Also, 55.6% (19) of the respondents strongly agreed that most of the functions in the procurement department are computerized (mean = 4.28, SD = 1.018). Moreover, 44.4% (15) of the respondents strongly agreed that county has adequate fund for the more implementation of technology (mean = 4.28, SD = 0.752). However, 33.3% (11) of the respondents were not sure if the county has highly qualified ICT personnel (mean = 3.44, SD = 1.097). Finally, all 34% (100) unanimously disagreed that the county has adequate ICT equipment (mean = 1). The results are illustrated in table 1 that, 44.4% (15) of the respondents strongly agreed that national government always comes to their aid when asked to do so (mean = 4.06, SD = 1.162). In addition, 38.9% (13) of the respondents agreed that the national government has provided adequate funds for implementation of new procurement procedures (mean = 3.89, SD = 1.132).

Also, 44.4% (15) of the respondents strongly agreed that most of the employees in the county procurement department are trained by the national government (mean = 3.78, SD = 1.592). As well, 38.9% (13) of the respondents strongly agreed that the national government has provided human capital support for the procurement department (mean = 3.72, SD = 1.447).

Table 1 also highlights the results on supplier responsiveness. From the table, 83.3% (28) of the respondents strongly agreed that suppliers are responsible for the results of the industrialization and manufacturing process of the supplied part (mean = 4.61, SD = 1.037). Also, 72.2% (25) of the respondents agreed that they take full responsibility on any complication that occurs during procurement process (mean = 4.5, SD = 0.924). Moreover, 66.7% (23) of the respondents strongly agreed that they have joint development work with suppliers (mean = 4.44, SD = 1.042). Finally, 55.6% (19) of the respondents strongly agreed that they make joint decisions regarding the supplied materials/products (mean = 3.83, SD = 1.505). The results on factor analysis are presented in table 1. The factor loading for each of the items is sorted by size. Any item that was found to have a loading not greater than 0.5 and loads on one and only one factor was dropped from the study (Liao et al., 2007; Wei et al, 2008). All loading were suppressed to 0.5 in the output. Thus from the findings all values for all the factors were more than 0.5 reflecting the accepted value of factor loading. A pilot study was carried out to determine reliability of the questionnaires. Reliability analysis was subsequently done using Cronbach's Alpha which measures the internal consistency by establishing if certain items

within a scale measure the same construct. Table 1 shows that all the five scales were reliable as their reliability values exceeded the prescribed threshold of 0.7. This therefore depicts that the research instrument was reliable and therefore required no amendments.

Table 1: Descriptive Statistics and Validity and Reliability Results

	Mean	Std. Deviation	Loading	Cronbach Alpha
Technology				
The county has adequate ICT equipment	1.00	0	0.754	0.893
The county has highly qualified ICT personnel	3.44	1.097	0.95	
Most of the functions in the procurement department are computerized	4.28	1.018	0.853	
The county use of technology is highly recognized by the national government	4.67	0.97	0.873	
The county has adequate funds for more implementation of technology	4.28	0.752	0.898	
Government support				
The national government has provided human capital support for the procurement department	3.72	1.447	0.929	0.945
The national government has provided adequate funds for implementation of new procurement procedures	3.89	1.132	0.962	
Most of the employees in the county procurement department are trained by the national government	3.78	1.592	0.956	
The national government always comes to our aid when asked to do so.	4.06	1.162	0.95	
Supplier responsiveness				
We have joint development work with suppliers	4.44	1.042	0.939	0.909
Suppliers are responsible for the results of the industrialization and/or manufacturing process of the supplied part	4.61	1.037	0.842	
We make joint decisions regarding the supplied materials/products	3.83	1.505	0.914	
We both take full responsibility on any complication that occurs during procurement process	4.5	0.924	0.895	

Correlation Results

Pearson's product moment correlation analysis was used to assess the correlation between the variables. The results in table 2 indicate that, there is positive and significant correlation between technology and e-procurement ($r = 0.591$, $p < 0.01$) and government support and e-procurement ($r = 0.301$, $p < 0.01$). This implies that government support was linearly correlated with e-procurement implementation. Thus indicating when government support increase there is likelihood of e-procurement implementation increasing. The results also indicate that there is a

positive and significant correlation between E-Procurement implementation and support-procurement implementation ($r = 0.610$, $p < 0.01$).

Table 2: Correlation Results

	E-Procurement implementation	Technology	Government Support	Supplier Responsiveness
E-Procurement implementation	1			
Technology	.591**	1		
Government Support	.301**	.741**	1	
Supplier Responsiveness	.610**	.823**	.787**	1

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

Hypothesis

Multiple regression analysis was conducted so as to determine the relationship between e-procurement implementation and the three variables (technology, government support and supplier responsiveness). The results from table 3 shows that the study multiple regression model had a coefficient of determination (R^2) of about 0.621. This means that 62.1% variation of supply chain performance is explained/predicted by joint contribution of technology, government support and supplier responsiveness. The F-value of 86.263 with a p value of 0.00 significant at 5% indicate that the overall regression model is significant, hence, the joint contribution of the independent variables was significant in predicting supply chain performance.

The first Hypothesis postulated that H_{01} : technology has no significant effect on E-procurement implementation. The results of multiple regressions, as presented in table 3 revealed that technology has a beta value of $\beta_1 = 0.337$, p-value = 0.001. Since the p value is less than < 0.05 . The null hypothesis is rejected. Therefore technology has significant effect on E-procurement implementation. In conformity with the findings, Kramer *et al.*, (2007) report that ICT has facilitated the procurement process of small business in Chile and this has positively affected on the functioning of the procurement system. The results of the study are also in line with Carayannis and Popescu (2005) assertion that continued improvements in internet technology provides an avenue for transparency and efficiency in the procurement for goods and services which ultimately leads to improved procurement performance. Thus, Hawking and Stein (2004) view technology as a major driver in supply chain.

The second hypothesis stated that H_{02} : government support has no significant effect on e-procurement implementation. The results of multiple regressions, as presented in table 3 revealed that government support has a beta value of $\beta_2 = 0.925$, p-value = 0.000 since the p value is less than < 0.05 . The null hypothesis is rejected. Government technology therefore has

significant effect on e-procurement implementation. In agreement with the results, Brinkerhoff (2004) echoes that key components of government support which include measurement of results, justification of those results and sanctions for non-performance helps to improve procurement performance. Furthermore, Tan et al., (2009) opines that the management needs to ensure that procedures are in place to ensure compliance with all relevant guidelines by the government so as to heighten procurement performance.

The third hypothesis stated that H_{03} : supplier responsiveness has no significant effect on e-procurement implementation. The results of multiple regressions, as presented in table 3 revealed that supplier responsiveness has a beta value of $\beta_3 = 0.969$, p-value = 0.000. Since the p value is less than < 0.05). The null hypothesis is rejected. Therefore supplier responsiveness has significant effect on e-procurement implementation. In particular, supplier responsiveness to changing market/customer requirements builds a supply chain that is flexible and cost effective hence heightening procurement performance (Artley, 2001). In a similar vein, David, (2002) argues that supplier responsiveness enables firms to create wealth for its stakeholders since suppliers react quickly and cost effectively to changing market requirements thus improving the procurement performance. As well, Shaw, (2001) asserts that supplier responsiveness has received wide attention in the scientific community since it has helped in improving procurement performance.

Table 3: Coefficient of Estimate

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	T	Sig.	Tolerance	VIF
(Constant)	1.725	0.156		11.029	0.000		
Technology	0.241	0.074	0.337	3.238	0.001	0.166	6.018
Government Support	0.382	0.051	0.925	7.547	0.000	0.12	8.359
Supplier Responsiveness	0.603	0.071	0.969	8.486	0.000	0.138	7.258
R ²	0.621						
		Adjusted R ²	0.613				
		ANOVA (F test)	86.263	ANOVA (Prob)	0.000		

a) Dependent Variable: e-procurement implementation

CONCLUSION AND RECOMMENDATION

The study has established that technology is key if E-procurement implementation is to be enhanced in the public sector. Specifically, technology use in the county is highly recognized by the national government. This has been due to the computerization of most of the functions in the procurement department. The adequacy of funds has also played a key role in the

implementation of technology. Despite the efforts that have been made in the adoption of technology use in the procurement process, there is inadequacy of ICT equipment.

Government support has also enhanced e-procurement implementation. From the study, the government has been of support to the firms in a number of ways. For instance, the national government has offered training to the employees, provided human capital support and has provided adequate funds for the implementation of new procurement procedures.

Finally, supply chain responsiveness is particularly important when operating in a competitive market. As such, suppliers are the ones responsible for the industrialization and manufacturing process. Furthermore, it was established that employees have joint development work with suppliers and that they take responsibility on any complication that occurs during the e-procurement implementation. Joint decision regarding the supplied materials is also made.

In light of the research findings, the researcher wishes to make the following recommendations: The study established that technology is instrumental in enhancing e-procurement implementation. It is therefore, necessary to computerize most of the functions in the procurement department. Also, technology needs to be adopted to ensure proper functioning of the procurement system. There is also evidence from the study showing that government support has role in e-procurement implementation. As a result, there is need for the government to offer training to the employees and avail adequate funds for the implementation of new e-procurement implementation. Finally, the study established that supply chain responsiveness plays a key role in increasing e-procurement implementation. There is therefore need for employees to have joint development work with suppliers and also to take responsibility of any complication that occurs during the e-procurement implementation.

However, the study was limited to public institutions only, hence there is a need for further study on determinants of e procurement in private sector. The study was also limited only to Technology, Government Support and Supplier Responsiveness as the only determinants for e procurement, thus, future studies need to focus on other factors such as leadership styles, funding among others.

REFERENCES

Aboelmaged, M.G. (2010), "Predicting e-procurement adoption in a developing country: an empirical integration of technology acceptance model and theory of planned behaviour", *Industrial Management & Data Systems*, Vol. 110 No.3, pp.392-414.

Akinyi M G., (2010). E-Procurement Model for the Public Sector of Kenya School of Computing and Informatics (<http://sci.uonbi.ac.ke>).

Anyango, P. (2005). Factors Affecting Effectiveness of IT on Procurement Function, Unpublished Research Project, Kenya Institute of Management, Nakuru.

- Artley, W. and Stroh, S. (2001) *The Performance-Based Management Handbook*. Performance-Based Management Special Interest Group (PBM SIG), Oak Ridge.
- Birks, C., Bond, S. & Radford, M. (2001). Guide to e-Procurement in the Public Sector: Cutting through the Hype. London, UK: Office of Government Commerce, HMSO.
- Brinkerhoff DW. (2004). Accountability and health systems: Toward conceptual clarity and policy relevance. *Health Policy and Planning* 19:371–9.
- Carayannis E G and Popescu D (2005) Profiling a Methodology for Economic Growth and Convergence: Learning from the EU eProcurement Experience for Central and Eastern European Countries. *Technovation*, Volume 25, Number 1, January, pp. 1-14
- Chebii, J. (2006). Effects of Computerization on Organization Performance. Unpublished Research Project, Kenya Institute of Management, Nakuru.
- Chepkonga, C. (2010). Factors Affecting Order Placement in Procurement Process, Unpublished Research Project, Kenya Institute of Management, Nakuru.
- Consortium for Global Electronic Commerce (CGEC) (2002, October). *Measuring and Improving Value of E-procurement Initiatives*. Madison, WI: University of Wisconsin-Madison, Consortium for Global Electronic Commerce.
- Cooper, D. R. & Schindler, P. S. (2001). *Business research methods*. New York: McGraw-Hill Companies
- Croom, S., Brandon-Jones, A. (2007), "Impact of e-procurement: experiences from implementation in the UK public sector", *Journal of Purchasing & Supply Management*, Vol. 13 pp.294-303
- David J. Day, George S.. 2002. *Wharton on Dynamic Competitive Strategy*. John Wiley, New York
- Davis, F. (1985). A technology acceptance model for empirically testing new end user information systems: theory and results. Unpublished Doctoral dissertation, MIT Sloan School of Management, Cambridge, MA.
- Department of Finance (DOF) (2001). Strategy for the Implementation of e-Procurement in the Irish Public Sector. Dublin, Ireland: Author
- Dong, S., Xu, S.X. and Zhu, K.X. (2009). "Information technology in supply chains: the value of IT-enabled resources under competition", *Information Systems Research*, 20 (1), 18-32
- Erasto, W. (2005). The Role of Vendor Managed Inventories in Customer/Supplier Chain, Unpublished Research Project, Kenya Institute of Management, Nakuru.
- Government of Kenya (GOK), (2004). Strategy Paper for IFMIS 2004 -2009. National Government Printer.
- Gunasekaran, A., Ngai, E.W.T. 2008. Adoption of e-procurement in Hong Kong: An empirical research. *International Journal of Production Economics* 113 (2008) 159–175.
- Hawking P, Stein A, Wyld C D and Foster S (2004) E-Procurement: Is the Ugly Duckling Actually a Swan Down Under. *Asia Pacific Journal of Marketing and Logistics*, Volume 16, Number 1, pp. 3-26
- Hui, Othman, Normah, Rahman, & Haron (2011). Procurement issues in Malaysia. *International Journal of Public Sector Management*, 24(6), 567-593
- Kaufmann, P. J., & Stern, L. W. (2009). Relational exchange norms, perceptions of unfairness, and retained hostility in commercial litigation. *Journal of Conflict Resolution*, 32, 534-552.
- Kenya's Public Procurement and Oversight Authority (PPDA 2005) The long term Policy Framework for Public Procurement in Kenya
- Kramer, J. W., Jenkins, B. and Katz, R. S., The role of information and communication technology sector in expanding economic opportunity. Initiative Report No 22, Cambridge, MA: Kennedy School of Government, Harvard University, 2007
- Leung W. (2007). Review on the Electronic Tendering System (ETS) of the Government of Hong Kong, Unpublished Masters Dissertation, University of Hong Kong.

Liao, C.H., Tsou, C.W. and Huang, M.F. (2007), "Factors influencing the usage of 3G mobile services in Taiwan", *Online Information Review*, Vol. 31 No. 6, pp. 759-774

Lysons, K, Farrington, B, 2006: Purchasing and Supply Chain Management,, *The International Journal Of Business Management*. In large corporations, a proper purchasing and supply chain structure may not be a strange

Mathane, R. (2007). Factors Influencing Adoption of E-procurement in the Supply Chain, Unpublished Research Project, Kenya Institute of Management, Nakuru.

Nunnally, J.C. (1978). *Psychometric theory*. New York: McGraw – Hill (second edition).

Ogot, M., Nyandemo, S., Kenduiwo, J. Mokaya, J., & Iraki, W., (2009). The long term Policy Framework for public procurement in Kenya, *Draft Zero in Public Procurement Oversight Authority*, University of Nairobi, Kenya.

Rogers E M. (1995). Diffusion of innovation model. <http://nnlm.gov/pnr/eval/rogers.html>.

Sekaran, U. (2003). *Research methods for business*. New York: John Wiley & Sons Inc.

Serem, T. (2005). Effects of Computerization of Kenya Ports Authority, Unpublished Research Project, Kenya Institute of Management, Nakuru.

Shaw, R. (2001), "CRM definitions – defining customer relationship marketing and management " , in SCN Education B.V. (Eds), *Customer Relationship Management: The Ultimate Guide to the Efficient Use of CRM*, HOTT Guide, 2001, available at: www.hottguide.com,

Tan, K. C., Lyman, S. B., & Wisner, J. D. (2009). Supply chain management: A strategic perspective, *International Journal of Operations & Production Management*, 22(6)

Tonkin, C. (2003). "E-Procurement in the Public Sector: Story, Myth and Legend". Paper presented to the Policy Institute, Trinity College Dublin on 18 November 2003.

Vaidya, K., Sajeev, A.S.M. & Callender, G. (2006). "Critical Factors that Influence e- Procurement Implementation Success in the Public Sector". *Journal of Public Procurement*, 6(1&3), 70-99

Ventura, J., Reise, S. P., Keefe, R. S., Hurford, I. M., Wood, R. C., & Bilder, R. M. (2013). The Cognitive Assessment Interview (CAI): reliability and validity of a brief interview-based measure of cognition. *Schizophrenia bulletin* , 39 (3), 583-591

Wahid, F. (2010), "Examining adoption of e-procurement in public sector using the perceived characteristics of innovating: Indonesian perspective", in Sideridis, A.B., Patrikakis, Ch.Z. (Eds), *E-Democracy*, Springer, Berlin, LNICST 26, pp.64-75

Waithaka, H. K., & Ngugi, K. (2014). Factors influencing Acquisition of Stressed Assets and Asset Securitization into the Financial Market in Kenya. *International Journal of Social Sciences and Entrepreneurship*, 1(2), 529-539

Walker, H. and Harland, C., (2008), "E-procurement in the United Nations: influences, issues and impact", *International Journal of Operations & Production Management*, Vol. 28, No. 9, pp. 831-857

Wangare, R. (2005). Top Performance through E-procurement, Unpublished Research Project, Kabianga University, Kericho.

Wanyama, W. (2012). Contribution of E-procurement in Enhancing Procurement Process, Unpublished Research Project, Kenya Institute of Management, Nakuru.

Weele Van, A.J. (2005). *Purchasing and Supply Chain Management*, (4th Ed). Thomson Learning, London.

Wei, T.W., Marthandan, G., Chong, A.Y.L., Ooi, K.B. and Arumugam, S. (2008), "What drives Malaysian m-commerce adoption? An empirical analysis. *Industrial Management & Data Systems*, Vol. 109 No. 3, pp. 370-388