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Challenges of Implementing E-Procurement in the Ministry of Transport, Infrastructure, Housing and Urban Development in Nairobi, Kenya

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Abstract

The purpose of the study was to investigate challenges of implementing e-procurement in Ministry of Transport, Infrastructure, Housing and Urban Development. The research adopted a mixed descriptive design. The target population of this study was the 142 e-procurement users in various departments under the Ministry of Transport, Infrastructure, Housing and Urban Development headquartered in Nairobi with 103 being used as the sample size. Both primary and secondary data were used in data collection whereby questionnaire was the key instrument for primary data collection with secondary data being obtained from relevant literature like journals, internet and books. Quantitative data was analyzed using descriptive and inferential statistics. Data was presented in form of tables, figures and charts. A multiple linear regression model was used to analyze the data using statistical package for the social sciences (SPSS). The study found a positive relationship amongst the variables. Relationship between legal framework, technological infrastructure, security of data, the relationship between employee competency and implementation of E-Procurement was positive. The findings of this study are useful to the policy makers and stakeholders in government ministries. By establishing the key ingredient in the; planning, designing and implementation of a sound public procurement system that aligned itself to the overall economic strategy. It will also be beneficial to the practitioners in determining the prospects and potential benefits of e-procurement and, the need to progressively move towards the implementation of e-procurement in public sector procurement.

Keywords: employee competency, legal framework, technological infrastructure, security of data, e-procurement.

1.0 Introduction

The impact of the internet on the business world has occurred with astonishing speed. The growth of e-business in the late 1990's led to the development of new opportunities related to procurement: e-procurement, spend management, outsourcing and joint product design (Rajkumar, 2011). E-procurement has emerged as one of the most discussed topic in material procurement. Without doubt, it will dramatically change the way purchasing is done in the near future (Croom, 2012). Governments of both developed and developing countries have embraced ICT to improve the quality of public service, increase public access to information and to energize more participation in civic affairs.

As a result, most countries have recognized public participation in government tendering process by enhancing access to opportunities available in the government authorities such as procurement activity (Ogot, Njihia & Mose, 2009). One of the factors behind this development has been the evolution of the procurement function towards a more strategic role in supporting both corporate goals and supply chain objectives. Furthermore, the advent of the Internet as a business systems platform has been catalyst for major changes, in the operation and status of organizational procurement. Information Technologies have changed the way organizations and governments operate. As noted by Nelson *et al.* (2012), the majority of organizational spending consists of purchasing.

Procurement process is the same across all public sectors and therefore e-procurement process can be standardized in all of its processes from ordering to contract management. The Council of Governors of Kenya recently admitted that e-procurement has led to delays in procurement functions because of poor network and system failures in their county governments. Globally, 60% of information and communication technology application in procurement activities and functions do not provide the expected results (Presutti, 2008). According to a study done by Aberdeen (2011), organizations that computerize and streamline workflows across numerous stakeholders sites such as suppliers produce 66% more improvement in reducing total time from order to delivery.

The Public Financial Reform Management (PFMR) Strategy Paper 2001-2006 of Kenya recommended automation as well as integration of key government functions such as the human resources payroll, accounting, procurement and budgeting citing transparency, better financial management and easier reporting as some of the benefits (GoK, 2001). According to the E-government Strategy Paper 2004 e-procurement was one of the medium term objectives which were supposed to be implemented by June 2007, but the implementation process was observed to be very slow (GoK, 2004). The National Treasury, is the Ministry in Government which is spearheading the public financial management reforms. Within the ministry, there is a department called the Integrated Financial Management Information System (IFMIS) Department which has the mandate of designing, spearheading and managing the Integrated Financial Management Information System re-engineering process in all central government ministries, county governments and all government agencies.

The Government of Kenya's economic blueprint for 2013-2017 notes that the ICT sector is important in the realization of the required improvement in productivity and empowerment of the citizenry. Hence a national ICT policy has been developed to enable and guide the growth of the country's ICT sector and integrate the sector into Kenya's development, help in creation of jobs, improve productivity, increase access to professional and government services, especially for disadvantaged individuals and communities, and allow communities to make informed decisions about local resource use (Government of Kenya, 2011).

1.2 Problem Statement

Over several years, there has been little or not enough technology in place to enable the government ministries to take full advantage of internet commerce. It identified issues such as identification of parties in a transaction, synchronization, confidentiality, data confidentiality and bandwidth as the major considerations that the government had to consider before taking full advantage of the benefits of E-procurement.

In the government of Kenya strategy paper of 2004, one of the objectives was the introduction of a computer based procurement which was to be implemented by June of 2007; however it has not significantly been implemented as per the deadline. The adoption of ICT is to change the way businesses operate in this era of globalization by changing business structures and increasing competition, creating competitive advantage for businesses and by changing business operations. Hence, for public entities to grow and become successful, they must have the ability to compete and dynamically respond to rapidly changing markets (Ongori, 2009). The traditional procurement process has involved slow manual procedures and even inefficient systematic process of handling procurement transactions (Hawking *et al.*, 2004).

According to Ongoro (2014), public entities are beginning to recognize the huge potential offered by the internet in general and E-procurement systems in particular. On 11th March, 2015 President of Republic of Kenya gave a one week ultimatum to officials in charge of public entities to adopt e-procurement in order to curb corruption and enhance transparency in how tenders are awarded. The head of state said the objective is to make government procurement processes be open to scrutiny by the public so that everyone can know how a tender is awarded. Procurement of goods and services constitute 50% of the government's annual budget and the e-procurement platform will save substantial financial resources and help installing confidence among tax payers that they are getting value for their money (Brown, 2015). In e-procurement practices in KRA, (2014) states that the process of electronic gathering of information has increased business relationship between KRA and its suppliers.

Subramaniam and Shaw (2011) notes that factors such as poor records management, long documentation process and questionable filling systems plus lack of proper procurement plan and inefficient post award contract execution, irregularity in making obligatory reporting to Public Procurement Oversight Authority and lack of utilization of standard requisitions are an obvious signal of an unsuccessful process. In public entities, procurement department is the avenue of spending on behalf of the organization hence this study focuses on finding out the challenges of implementation of e-procurement in a government ministries which is a public entity. In the prior studies on e-procurement application many have primarily focused on investigating its

benefits or adoption mainly in manufacturing but research examining the factors influencing the application of e-procurement systems by public entities is minimal. This study aimed to fill this gap by research examining the challenges of implementing E-procurement in Ministry of Transport, Infrastructure, Housing and Urban Development.

Study Objectives

- i. To determine the effect of employee competency on e-procurement implementation in Ministry of Transport, Infrastructure, Housing and Urban Development
- ii. To find out the effect of legal framework on e-procurement implementation in Ministry of Transport, Infrastructure, Housing and Urban Development
- iii. To establish the effect of technological infrastructure in e-procurement implementation in Ministry of Transport, Infrastructure, Housing and Urban Development
- iv. To examine the effect of security of data in e-procurement implementation in Ministry of Transport, Infrastructure, Housing and Urban Development.

2.0 Literature Review

2.1 Theoretical Literature Review

2.1.1 Institutional Theory

Institutional theory is the appropriate theoretical framework for this study because it is well suited in understanding the behavior of organization. A study on institutional isomorphism and public sector organization by Boer *et al.* (2002) concluded that governmental organizations are much more vulnerable to intuition process than for profits, this is supported by Asworth *et al.*, (2007) who concluded that “intuition theory has become a prominent length through which organizational processes are interpreted and understood”. Institutional theory was proposed by DiMaggio and Powell (1983) they stated that organizations do not exist in a vacuum but interact with environment to achieve mission and objectives. Therefore the theory emphasizes on how the organization should behave through a pattern on social norms that evolve over time and become legitimized within an institution or society (Jeyaraj *et al.*, 2006).

2.1.2 Technology Acceptance Model (TAM)

Hamad (2014), noted that Technology Acceptance Model (TAM) was used to determine the factors causing the adoption of IT to be either accepted or rejected. The first form of the Technology Acceptance Model (TAM) is an adjustment of the Theory of Reasoned Action (TRA), this was made particularly for modeling the acceptance of adopting technology. The model tries to explain the decisions around the adoption of technology by considering the effect of external elements on attitudes; internal beliefs; and intentions. Through studies, confirmed that, compared to perceived ease of use, perceived usefulness was linked more strongly to the adoption of IT and usage because, in order to gain the benefits from adopting IT, organizations might be willing to adopt and make use of more complicated technology. TAM theory supports the variable technological infrastructure in explaining e-procurement implementation in Ministry of Transport, Infrastructure, Housing and Urban Development.

2.1.3 Systems Theory

Bertalanffy (1972) defines system theory as the trans disciplinary study of systems in general, with the goal of elucidating principles that can be applied to all types of systems at all nesting levels in all fields of research. The term does not yet have a well-established, precise meaning, but systems theory can reasonably be considered a specialization of systems thinking, a generalization of systems science, a systems approach. The term originates from Bertalanffy's General System Theory (GST) and is used in later efforts in other fields, such as the action theory of Talcott Parsons and the system-theory of Niklas Luhmann. Systems theory on the other hand, which has its origins from the work of German biologist Von Bertalanffy who understood the limitations of these traditional approaches. He saw the need to create a revised approach and hence emerged systems theory (Irving, 1999). The theory supports the variable legal framework by indicating how all organizations interact with outside world as they are often systems. Sections of organizations interact amongst themselves in exchange of key information and materials.

2.2 Empirical Review

Mbeche *et al.*, (2014) argued that skills and knowledge of employees influence the future adoption of a new technology. They further argued that implementing e-procurement necessitates knowledgeable and skilled employees, therefore, the conspicuous lack of such personnel has attributed to delay in e-procurement adoption in most public institutions. Literature has established that there exist a direct correlation between an institution's capacity to explore new technology and its pool of human resources. A feasibility study on implementation of full e-procurement in Tanzania pointed out some key issues including readiness of existing legislative framework, Information and Communication Technologies (ICTs), infrastructure and users (Mchopa, 2015). For an effective and efficient computer based procurement to be adopted there is the need for the maintenance of employee competence by ensuring that they are trained on related issues so that they can appreciate the legal frameworks and networks of their suppliers in the conduct of their business (Muguro, 2014).

A study by PPA (2012) that was conducted on about 100 major procuring entities found that the principal goal of the reviews has been to help entities develop capacity building programs which enable them better apply the provisions of the Act and the Regulations. Procurement Assessments, on the other hand, have been carried out to check the level of performance of the procurement function in the selected entities to establish their strengths, weaknesses and areas that require assistance and improvement. Furthermore, the Public Procurement Authority recognize that the existing PPA 2005 and PPDR 2006 legal framework in Ghana may not have adequately covered aspects of e-procurement transaction (PPA, 2009). The weakness in this frame work therefore may inhibit the adoption and growth of e-procurement initiatives. Understanding the challenges and limitation of e-procurement adoption in the public sector is important due to complexities of government policies and bureaucracy. Without such understanding, government may not be able to achieve the benefits of e-procurement. These benefits could assist in future planning and adoption of e-procurement.

A study by Parasuraman and Colby (2009) on Greece firms pointed that technology readiness (TR) is a key factor in the adoption of innovative products and services. TR refers to the propensity to adopt and embrace technology in home life or work. It reflects a set of beliefs about

technology and is not an indicator of competence. TR is highly predictive of the speed of technology adoption and level of usage of technology in consumer households and organizations. TR is multifaceted, with some factors being contributors and some factors behind inhibitors. In addition, a recent commercial report by IDC (2003) demonstrated that there remained a slow uptake of e-procurement systems, emphasizing that system infrastructure-related issues such as software integration (including discussion of XML related opportunities) were inhibiting implementation. Kheng and Al-Hawandeh (2002) investigated the adoption of e-procurement in Singapore and presented stumbling blocks to this initiative from the point of view of Singaporean firms and that significant investment in hardware, software, and personnel training to participate in e-procurement are prohibitive.

Saeed and Leith (2003) examined buyers' perceptions of e-procurement risks and arrived at three dimensions: first transaction risks resulting from wrong products purchased due to incomplete or misleading information; Second security risks resulting from unauthorized penetration of trading platforms and failure to protect transaction related data while being transmitted or stored; and Third privacy risks arising from inappropriate information collection and information transparency. Yen and Ng (2002) found that both buyer and seller firms in their sample considered the lack of adequate security measures to protect data as one of the prohibitive and discouraging factors in implementation of e-procurement.

According to Lee (2008), central changes are required in the general population part obtainment environment to accomplish the advantages of the e-Procurement approach. Lee, likewise found that the key issues can be assembled into various zones, these are: acquisition structure and practices, authoritative plan, E-acquirement innovation system, and the legitimate and financial environment. Among these issues, a solid and proficient hierarchical perspective can be acknowledged as an extremely basic achievement calculates for productive e-Government acquirement selection. In a nation like Turkey, colossal foundation speculation is a typical practice. Notwithstanding, since these speculations are vigorously influenced by fleeting political concerns and voter impact, ventures work more often than not at imperfect rate. Seldom do you locate an arranged and deliberate approach.

According to e-government strategy paper (2004), e-procurement was one of the medium term objectives which was to be implemented by June 2007, but the process has been very slow and findings show that most of the procurement processes in public sector are still manual with the internet only being used for e-mails and web browsing (PPOA, 2013). This slowed implementation of e-procurement in the public sector raises concern as to what challenges face implementation of e-procurement in the government ministries in Kenya. Regardless of the recognition of the value of e-procurement, it is clear from the study by Gunasekaran and Ngai (2008) that the implementation of e-procurement is still very slow. It is against this background that the study sought to find out the challenges of implementing e-procurement in Government ministries.

2.3 Conceptual framework

Independent Variables

Dependent variable

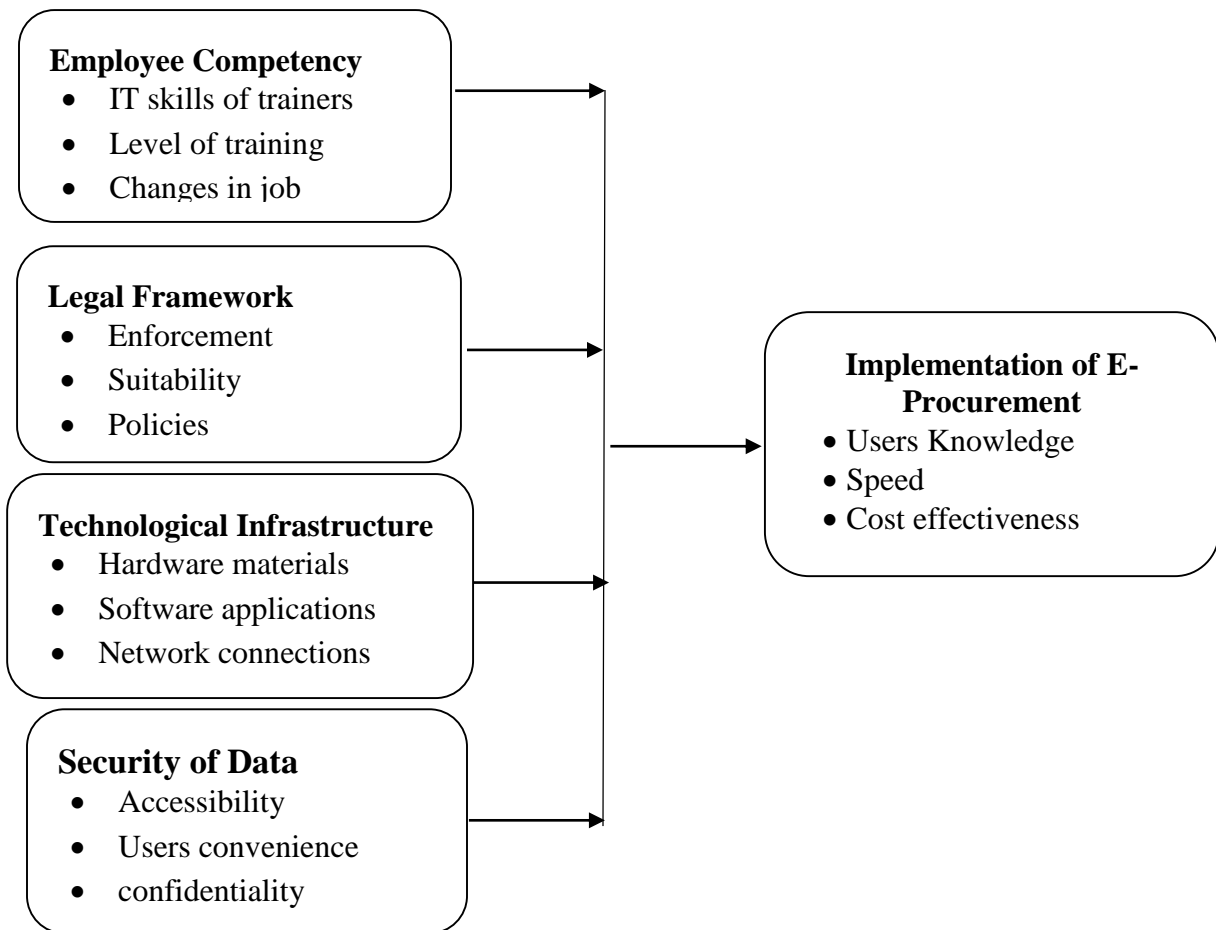


Figure 1: Conceptual framework

3.0 Research Methodology

The research adopted a mixed descriptive design. The target population of this study was the 142 e-procurement users in various departments under the Ministry of Transport, Infrastructure, Housing and Urban Development headquartered in Nairobi with 103 being used as the sample size. Both primary and secondary data were used in data collection whereby questionnaire was the key instrument for primary data collection with secondary data being obtained from relevant literature like journals, internet and books. Quantitative data was analyzed using descriptive and inferential statistics. Data was presented in form of tables, figures and charts. A multiple linear regression model was used to analyze the data using statistical package for the social sciences (SPSS).

4.0 Results and Discussions

4.1 Results Presentation

Regression Analysis was conducted to determine the relationship between variables. Table 1 indicates that the R square value was 0.634.. This implied that 63.4% of the variation in the dependent variable was attributed to changes in the independent variables which included employee competency, legal framework, technological infrastructure and security of data. Nevertheless, the other factors not studied in this study contributed the remaining 36.6%.

Table 1: Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.796	0.634	0.602	0.99846

The ANOVA findings in Table 2 showed that the regression significance was 0.005 which was less than 0.05 thus showing that the regression model was indeed significant in showing the relationship between the e-procurement implementation and the independent variables of the study that is employee competency, legal framework, technological infrastructure and security of data.

Table 2: Analysis of Variance (ANOVA)

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	3.8934	4	2.187	3.174	.005
Residual	1.256	119	0.874		
Total	5.1494	123			

Table 3: Beta Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.137	.0126	3.158	0.187	0.000
Employee Competency	.214	.211	.255	1.117	0.002
Legal Framework	.566	.013	.188	1.987	0.004
Technological Infrastructure	.367	.014	.077	1.134	0.001
Security of Data	.330	.002	.232	1.647	0.000

The regression equation is as shown below:

$$Y=0.137+0.214X_1+0.566X_2+ 0.367X_3 + 0.330X_4$$

The coefficient results in Table 3 inferred that the ratio of dependent variable (Implementation of e-procurement) was 0.137 when all the independent variables were held constant. A unit increment in employee competency increased the ratio by 0.214. Furthermore, a unit increment in legal framework increased the ratio by 0.566. Additional increment in technological infrastructure increased the ratio by 0.367 and a surplus increment in security of data increased the ration by 0.330.

A positive relationship was noted amongst the variables. The regression coefficient for legal framework is 0.566. This means that the relationship between legal framework and implementation of e-procurement is positive. This indicates that effective use of legal framework result to an increase in implementation of e-procurement in government ministries and vice versa.

The regression coefficient for technological infrastructure was 0.367. This means that the relationship between technological infrastructure and implementation of e-procurement is positive. This implies that an improvement in technological infrastructure, its integration and amount of investment in software and hardware can result to effective implementation of e-procurement in government ministries and vice versa.

Furthermore, the coefficient results for security of data is 0.330. This means that the relationship between security of data and implementation is positive. This infers that effective security of data such as safety of individual end users and entire business units is likely to significantly influence certification, leading to an increase in implementation of e-procurement in government ministries and vice versa.

Finally, the regression coefficient for employee competency is 0.214. This means that the relationship between employee competency and implementation is positive. This indicates that employee competency such as skills and knowledge in regard to determination of specifications, defining requirements, conducting supervisory roles positively influences implementation of e-procurement in government ministries and vice versa.

4.2 Discussion

In regard to employee competency, the study found that inadequate staff competencies hinder e-procurement implementation in the organization. The study also found that incompetency does not produce timely information, incompetency does not produce consistent information and incompetency does not produce steadfast information.

The study found that inadequate legal framework poses a great challenge to the implementation e-procurement in organizations. The overwhelming evidence throws an enormous task at the Public Procurement and Regulatory Authority to come to the realization that the current legal framework in government ministries may not have adequately covered all aspects of e-procurement transactions. Hence, poses transactional risk to e-procurement practitioners and prospective organizations. It further found that electronic signatures are not enforceable in the ministry and electronically copied documents are not covered by the copyright laws.

On matters concerning security, the study found that security of data was to a great extent a challenge to e-procurement implementation. The study found that employees' uncertainty over

trust and commitment among trading partners was one of the main reason as to why security of data posed a challenge on the e-procurement implementation in government ministries.

The study further found that sufficiency of technological infrastructure affect e-procurement implementation in government ministries. In a drive to shift from paper-based transaction to an e-enabled transactional platform many of the organizations are confronted with huge technological deficiency resulting from laxity and the unwillingness on the part of management of these organizations. It found that administrative savings of the order, inventory could be reduced by 20 – 25%, increased difficulties in reducing staff numbers and sourcing cycle times could be reduced.

5.0 Conclusions

The study concluded that inadequate legal framework is a difficulty in the implementation of e-procurement in the public sector in government ministries. The overwhelming evidence throws an enormous task at the Public Procurement and Regulatory Authority to come to the realization that the current legal framework in government ministries may not have adequately covered all aspects of e-procurement transactions. Hence, poses transactional risk to e-procurement practitioners and prospective organisations. It further concluded that electronic signatures are not enforceable in the ministry and electronically copied documents are not covered by the copyright laws.

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6.0 Recommendations

Due to the fact that inadequate legal framework was a challenge to e-procurement adoption, formal recognition backed by legislation of the electronic procurement transactions should be encouraged to accelerate the rate of Implementation of the System within the public sector.

The study recommends that due to continuous turnover of employees, continuous training for the incoming staff is required, for those organizations that have already been ISO accredited, training is compulsory and should be implemented. This should cover e-procurement and therefore mitigate the effects of this barrier.

This paper recommends that there should be conscious efforts by management of these institutions to integrate organizations' technology and those of the suppliers, demonstrating the positive impact of the system, and installing linkages between all Governments agencies.

The study adds that due to the sensitivity of the government data and the legal nature of orders and payments, security of data is critical in e-procurement systems. The e-procurement system must have mechanisms for identifying and authenticating the user who places an order so that the supplier knows it is safe to fulfill the order.

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