

TRAINING AND SUPPLIER ADOPTION AS DETERMINANTS OF IMPLEMENTATION OF E-PROCUREMENT AT RONGO UNIVERSITY, KENYA.

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Abstract: The study sought to understand the determinants of implementation of e-procurement in higher learning institutions and in particular at a case of Rongo University. The study had two objectives namely: To determine the effect of training on implementation of e-procurement in Rongo University, and; To determine the effect of supplier adoption on implementation of e-procurement in Rongo University. The technology acceptance model and diffusion of innovations theories are the models used for this study. A descriptive research design was adopted to achieve the objectives and a quantitative method was employed to gather data from staff of Rongo University. A sample size of 79 respondents was purposively selected. A questionnaire was used to collect data which was then analyzed using descriptive statistics. Multiple regression analysis was used to show the relationship between the independent and dependent variables. The study findings revealed that the employees of the Rongo University perceived training as being central to effective adoption of e-procurement. The study therefore recommended that Rongo University should establish e-procurement team with information technology expertise and constantly improve their knowledge and skills through regular training. The study equally recommended that the top management should remain committed towards the implementation process of the e-procurement in the university.

Keywords: Training, Supplier Adoption, E-procurement, Determinant

1.1 Introduction

E-procurement has developed as a revolutionary and progressive phenomenon in the manner conducting business in the world (Schneiderjans & Cao, 2002; Kamarulzaman, Mukherjee, & Rashid, 2013). Furthermore, e-procurement is emerging internationally and therefore initiatives have been implemented in Singapore, UK, USA, Malaysia, Australia and European Union (Omany, Njeri, & Mungai, 2013; Adero, 2014 ; Jeptoo & Karanja, 2017). However, the adoption of e-procurement in Africa is a new phenomenon although some initiatives have already being undertaken by few private companies especially owned by foreign investors in large part. (Kushoka, 2005; Alban, 2012; Mose, Njihia, & Magutu, 2013). E-procurement is still lagging behind as the initiatives slowly progressing and mostly things are done manually through following the traditional procurement (Alban, 2012; Akibate, 2014).

Organizations have stood or fallen on the premise of how they embrace the technological advancement for example electronic procurement. The study sought to address the following research objectives in the course of the study. First, to determine the effect of training on implementation of e-procurement in Rongo University. Second, to determine the effect of supplier adoption on implementation of e-procurement in Rongo University. The study also endeavored to test following research hypotheses:

H₀₁: There is no significant relationship between training and implementation of e-procurement in Rongo University.

H₀₂: There is no significant relationship between supplier adoption and implementation of e-procurement in Rongo University.

Despite the order by the President of the Republic of Kenya and subsequent rolling out of e-procurement in Kenya on 13th August, 2014, there has been laxity by MDAs to migrate to the use of this system of procurement. In the modern competitive business environment, organizations need to embrace ICT in order to remain competitive. A number of public sector agencies worldwide have identified e-procurement as a priority government agenda and have implemented or are in the process of implementing e-procurement systems (Kishor, Sajeev, & Callender, 2006; Kirimi & Shalle, 2014).

In spite of the great benefits of e-procurement technologies, its implementation is still at early stages (Davila, Gupta, & Palmer, 2003; Aboelmaged, 2010; Kirimi & Shalle, 2014). Studies done locally on the implementation of e-procurement have concentrated on other sectors other than the government ministries (Kangogo & Gakure, 2013; Odago & Mwajuma, 2013; Omany, Njeri, & Mungai, 2013). The question is that despite numerous benefits on the use of e-procurement, its implementation has largely been slow. This study is therefore intended to bridge the knowledge gap by seeking to examine factors affecting implementation of e-procurement in public sector in Kenya.

1.2. Literature Review

1.2.1 Essence of e-procurement

E-procurement refers to the use of Internet-based (integrated) information and communication technologies (ICTs) to carry out individual or all stages of the procurement process including search, sourcing, negotiation, ordering, receipt, and post-purchase review (Croom & Brandon-Jones, 2004; Muffato & Payaro, 2004; Rasheed, 2004; Gunasekaran & Ngai, 2008; Garrido, Gutierrez, & Jose, 2008; Abu-Elsamen, Chakraborty, & Warren, 2010). Furthermore, e-procurement is the amalgamation of sales and purchasing business models and calls for differentiation based on application and functions (Wilson, 2002).

While there are various forms of e-procurement that concentrate on one or many stages of the procurement process such as e-tendering, e-sourcing, e-advertising, e-payment, e-invoicing, e-catalogue, e-procurement is an end-to-end solution that integrates and streamlines many procurement processes throughout the organization (Kirimi & Shalle, 2014; Uddin, 2015; Obel, Abiero, & Njeru, 2016). The study was based on the Diffusion of Innovations Theory which refers to the process that occurs as people adopt a new idea, product, practice, philosophy, and so on (Rogers, 2003). Rogers (2003) mapped out this process, stressing that in most cases, an initial few are open to the new idea and adopt its use.

1.2.3 Training and Implementation of E-Procurement

Researchers in Information Systems have produced a rich collection of meta-analyses and models of factors influencing the training of information technologies. In the domain of Computer Supported Cooperative Work (CSCW), however, these models have largely been neglected, and while there are many case studies, no systematic account of uptake has been produced. We can therefore use findings from Information Systems research to structure a meta-analysis of training issues as reported in CSCW case studies, supplemented by detailed re-examination case studies from this perspective. This shows that while there are some factors that seem to be largely specific to CSCW introductions, many of the case study results are very similar to standard IS findings. End-users can realize the immediate benefits of the e-procurement system once they understand the operational functionalities (Consortium for

Global Electronic Commerce, 2003). This means that training should be given a high priority, alongside the need for public sector agencies to identify the skills required by all those engaged in e-procurement (ECOM Group, 2002).

2.3 Supplier Adoption and Implementation of E-Procurement

Studies show that e-procurement implementation success is closely related to early supplier involvement (Birks, Bond, & Radford, 2001). It is important to demonstrate the proposed solution to the suppliers and discuss any necessary changes, issues, and concerns such as various options in developing and maintaining supplier catalogues (Birks et al., 2001). Technology alone does not ensure successful adoption; the success of a public sector e-procurement initiative depends on users and buyers making use of the new process and system. The success of the implementation project also depends on communication to the users. Most of the public institutions have not fully adopted the e-procurement due to the obstacles encountered during the implementation (Birks et al, 2001).

Finally, the supplier must be supported throughout the adoption process. This was evident in Scotland and Italy where a supplier engagement process was developed, documented and facilitated to ensure that suppliers business and technical requirements were met. The result was a high incident in supplier activity. Moreover, Neef (2001) recommends that key suppliers should be seen as an integral part of the e-procurement project, provided with clear and attainable milestones and directly included in the change management plan. The researcher adopted two theories that are Technology Acceptance Model and Diffusion of Innovations as the driving theories for the adoption of new technology by organizations.

1.3. Methodology

The study utilized descriptive research design that describes a phenomenon, event, pattern and historical trend without attempting to determine what causes the phenomenon (Johnson & Christensen, 2017; Salkind, 2017; Spickard, 2017). A sample size of 79 was used in the study. The respondents were selected using stratified sampling technique which is a method by which the population is divided into homogeneous, mutually exclusive segments, groups or levels of a population called 'strata' and independent samples are then randomly selected from each stratum (Altinay, Paraskevas, & Jang, 2015; Hair, Celsi, Money, Samouel, & Page, 2016; Bordens & Abbott, 2017; Salkind, 2017). The data was gathered using questionnaires which are set of questions to be used on a survey and where respondents are asked, with instructions that are appropriate showing which questions are supposed to be asked, and in what order (Sreejesh, Mohapatra, & Anusree, 2014; Ruel, Wagner, & Gillespie, 2016; Spickard, 2017).

The study used descriptive statistics, which was intended to illuminate the data, so that their core characteristic was revealed (Singh, 2006; Bowers, 2008). F-test was used to test the hypothesis and is usually used to check if the two samples used in the study were from the same population that is normal from two populations that are normal with equal variances or with variance that are equal (Kothari, 2004; Field, 2009). Specifically, means and standard deviations were used to explore prevailing levels of the independent variables within the University College. Next, multiple regression was used to test the formulated hypotheses with regard to implementation of e-procurement in higher learning institutions. In using multiple regression analysis the researcher made the following assumptions; that the data collected was normally distributed, that there were no univariate outliers, that variable was linearity dependent, multiple regression residuals was uncorrelated and that there was homogeneity of variances (Tabachnick & Fidell, 2007 ; Field, 2009).

In this case, the following multiple regression model was examined.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon, \text{ where,}$$

Y = Implementation of e-procurement

X_1 = training

X_2 = Supplier Adoption

$\beta_{i,s}$ Regression coefficient of the two independent variables

ϵ =error term

In line with assumptions of multiple regression, data was first cleaned for missing values, normality, linearity, outliers and homogeneity of variances.

1.4. Results and Discussion

1.4.1 Demographic Information

The employee respondents comprised of 62 percent (49) males and 38 percent (30) females. The common age of the employee respondents was 31-40 years (49.4 percent) followed with age 25-30 years (35.4 percent). It appears from the results that most employees of the institution are in the active age of between 25 years and 50 years.

1.4.2 Training

The first objective of the current study focused on establishing the contribution of training on implementation of e-procurement. On the basis of the mean response scores and associated standard deviations on corresponding items presented in Table 2, respondents tended to agree that they support the use of e-procurement in the supply chain management ($M=4.34$, $SD=1.024$); that use of e-procurement could improve their job performance ($M=4.10$, $SD=1.150$); that use of e-procurement could have a positive impact on their productivity ($M=3.97$, $SD=0.987$); and that use of e-procurement could help them be more effective ($M=3.74$, $SD=1.181$). The standard deviations to these mean response scores were further found to be relatively small indicating consistency in the responses.

On the contrary, respondents tended to moderately agree that they would be happy to use e-procurement in their work ($M=3.38$, $SD=1.343$); that their interaction with e-procurement was likely to be satisfying ($M=3.30$, $SD=1.191$); that there is need to put in motion training on e-procurement usage ($M=3.16$, $SD=1.350$); that procurement division should provide them with appropriate and specific training to use the system ($M=3.08$, $SD=6.080$); that e-procurement instructions and procedures should be availed ($M=2.85$, $SD=1.375$); that they should be involved in the decision making on use of e-procurement ($M=2.77$, $SD=1.386$); and that there is need to continuously train suppliers on benefits of e-procurement ($M=2.65$, $SD=1.272$). The standard deviation of the mean response to provision of appropriate and specific use of the system indicated that responses on this item were quite inconsistent. This could possibly be a result of feelings that not all employees require training on e-procurement. Interestingly, respondents tended to disagree that an effective training programme be put in place to improve procurement staff skills ($M=2.43$, $SD=1.195$). Table 2 presents summary statistics of these results.

Table 1: Employee Perception of Training

Response items	Std			
	Mean	Dev	Skewness	Kurtosis
1. I support the use of e-procurement in the supply chain management	4.34	1.024	-1.691	2.238
2. Using e-procurement system in my job can improve my job performance	4.10	1.150	-1.447	1.608
3. Using e-procurement system in my job can have a positive impact on my productivity	3.97	.987	-1.180	1.539
4. Using e-procurement system in my job could help me to be more effective	3.74	1.181	-1.197	.879
5. I would be very pleased with using e-procurement system in my work	3.38	1.343	-.470	-.903
6. My interaction with e-procurement system is likely to be very satisfying	3.30	1.191	-.195	-.792
7. Employee training on e-procurement usage should be put in motion	3.16	1.350	-.229	-1.193
8. The procurement division should provide me with appropriate and specific training to use the system	3.08	6.080	8.177	70.504
9. E-procurement operations instructions and procedures should be availed	2.85	1.374	-.086	-1.353
10. I should be involved in the decision making on the use of e-procurement	2.77	1.386	.362	-1.117
11. There is need to continuously train suppliers on benefits of e-procurement	2.65	1.272	.137	-1.161
12. An effective training program should be put in place to improve procurement staff skills	2.43	1.195	.493	-.609

These results imply that employees perceive training as being central to effective adoption of e-procurement in the institution. They clearly point to the need to train staff in procurement practices since e-procurement includes new technologies and changes in traditional procurement approaches. They also agree that end users who include the entire workforce and customers can realize the immediate benefits of the e-procurement if they understand operational functionalities. In agreeing that e-procurement operational instructions and procedures be availed, they tended to indicate that the entire process ought to be made attractive so that they can adopt e-procurement as their preferred means of day to day purchasing operations. These results further point towards compliance with best practices noting that e-procurement can only deliver desired benefits if the users and suppliers make changes to the way they work.

Hypothesis H₀1 stated that there is no significant relationship between training and implementation of e-procurement. To test this claim, the multiple regression model was used. Multiple regression was preferred since it is the best approach to conduct influence analysis when several independent variables exist. The model summary presented in Table 3 indicates that the value of the Durbin-Watson statistic was 2.049. Since this value was within the interval 1.50 to 2.50 (Tabachnick & Fidell, 2007), prediction of dependence errors was adjudged not to be correlated. Further, results show that the adjusted R-square value was 0.669. This implies that the combined determinants identified in this study explain up to 66.9 percent of the variance in implementation of e-procurement. Hence other factors not considered in the current study account for 33.1 percent of variance in implementation of e-procurement in institutions of higher learning.

The findings in this study that training has a positive and significant effect on implementation of e-procurement is consistent with several other findings. According to the World Bank draft strategy (World Bank, 2004), e-procurement includes new technologies and changes in traditional procurement approaches. In this regard, a critical factor to the success of e-procurement initiatives remains training of staff in procurement practices and the use of e-procurement tools.

Table 2 Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.831 ^a	0.690	0.669	0.44121	2.049

a. Predictors: (Constant), Training

b. Dependent Variable: implementation of e-procurement

1.4.3 Supplier Adoption

The second objective of the current study sought to determine the effect of supplier adoption on implementation of e-procurement in institutions of higher learning. The mean response scores in most of the items were approximately 3.00 indicating moderate agreements among respondents. In particular, respondents tended to moderately agree that the e-procurement system ought to move smoothly from one screen to the next (M=3.30, SD=1.323); that the institution has to involve suppliers in e-procurement adoption decisions (M=3.14, SD=1.223) that the procurement unit be able to respond quickly to supplier needs (M=3.11, SD=1.345); that the system should allow easy navigation of the process (M=3.07, SD=1.294); that efficient procurement mechanisms be used in procurement (M=2.90, SD=1.369); and that the procurement unit should always honor promises made to suppliers (M=2.76, SD=1.129).

Respondents however, tended to disagree that the level of efficiency of operations in procurement unit can improve due to e-procurement (M=2.30, SD=1.091). This negative perception on level of efficiency is possibly borne from the fact that level of efficiency is a function of several factors which may not necessarily be the mode of procurement. Table 4.3 presents summary statistics of these results.

Table 3: Employee Perception of Supplier adoption of E-procurement

Response items	Mean	Std Dev	Skewness	Kurtosis
1. The e-procurement system ought to move smoothly from one screen to the next	3.30	1.323	-.395	-.919
2. RU has to involve suppliers in e-procurement adoption decisions	3.14	1.223	-.581	-.633
3. The procurement unit should be able to respond quickly to suppliers needs	3.11	1.345	-.439	-1.141
4. The e-procurement system should allow easy navigation of the process.	3.07	1.294	-.324	-1.054
5. Efficient procurement mechanisms should be used in procurement	2.90	1.369	-.176	-1.214
6. The procurement unit should always get back to suppliers when they promise to	2.76	1.241	.209	-.861
7. The level of efficiency of operations in procurement unit can improve due to e-procurement	2.30	1.091	.211	-1.230

The implication of these results is that employees of the institution recognize the importance of involving suppliers in decisions directed towards e-procurement adoption. They recognize that there is need to be responsive to the needs of the suppliers so that this system can be a success. Indeed, feedback from suppliers is necessary for monitoring areas of improvement in the entire process.

Hypothesis H₀₂ stated that there is no significant relationship between supplier adoption and implementation of e-procurement. In trying to test the significant of the model, the study used ANOVA. Further the ANOVA output shown in Table 5 reveals that the hypothesized multiple regression model was statistically adequate. The F-statistic value was significant at the 5% level (F_{5,73} = 6.320, p<0.05). This shows that the regression coefficients were significantly different from zero. Hypothesis H₀₂ postulated that supplier adoption has no effect on implementation of e-procurement. To test this postulation, the multiple regression was used. The test results of this postulation shown in Table 5 revealed that supplier adoption is a positive and significant predictor of implementation of e-procurement. The implication of the beta coefficient is that an increase of 1 standard deviation in supplier adoption is likely to result in an increase of 0.356 standard deviations in implementation of e-procurement and vice versa.

Table 4 : ANOVA^b

Model	df	Mean Square	F	Sig.
1 Regression	5	6.320	32.468	.000 ^a
Residual	73	.195		
Total	78			

- a. Predictors: (Constant), Supplier adoption
- b. Dependent Variable: implementation of e-procurement

The finding that supplier adoption positively and significantly predicts the implementation of e-procurement is in support of the views derived from the descriptive analysis of both employee and supplier respondents. According to employees, involvement of suppliers in the planning and implementation of e-procurement is important since feedback from the suppliers comes in handy when monitoring and identifying areas of improvement. In support of these sentiments, suppliers concur that they are ready and willing to adopt the system if they are involved in decisions surrounding the planning and implementation of the system. Recognition of the key role played by suppliers is further highlighted in senior management's assertion that they find the current procurement process better than in previous years. In support of their arguments, they point towards supplier involvement and consolidation of suppliers and contracts as major changes adopted.

1.5. Conclusions and recommendations

In view of the findings summarized above, it can be concluded that higher learning institutions and in particular Rongo University have the necessary framework to implement e-procurement. This can however be realized if several factors are put into consideration. First and foremost, Training should be given priority. Training of staff in procurement practices and the use of e-Procurement tools are critical to the success of the e-procurement initiative. The staff of the institution needs to acquire the necessary skills that can enable them to operate effectively and efficiently while using the new e-procurement system. If staff is not adequately trained, they may not be able to own the e-procurement system and this may contribute to failure. The success of e-procurement initiative depends on users and suppliers making use of the new process and system. The success of e-procurement also depends on communication to the users. The institution must be able to communicate this information to the users by fully involving them in decisions regarding its implementation. Supplier adoption is also crucial to implementation of e-procurement. This is important since user acceptance of new information system has a critical and profound impact on the overall usage and success of the system's adoption. User acceptance and usage of a system defines the effectiveness or ineffectiveness of the system. Understanding the factors that influence user acceptance of IT is therefore undoubtedly of crucial interest to the institution management team.

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