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FACTORS AFFECTING ADOPTION OF E-TENDERING SYSTEM AMONG PUBLIC INSTITUTIONS IN KISII COUNTY, KENYA

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Abstract

E- Tendering projects are often part of a country's larger e- Government efforts to better serve its citizen and businesses in the digital economy. E- Tendering applications focus on creating efficiencies; their goal is to make the traditional purchasing procedures more efficient and cost effective. In Africa, the subject of public procurement is gaining momentum as nations strive to achieve the best from their procurement activities. Several changes have taken place in Kenya concerning ICT though not properly through a legal framework over the first 10 years of inception. This research focused on identifying the factors of e-tendering practices among public institutions in Kisii County Government offices. The study established that installation costs, maintenance cost, employees training costs and cost of e-procurement systems and software affect adoption of e-tendering system to a great extent. As such, the intervention of the central government of Kenya would help in reducing these costs through offering subsidies to Kisii County Government so that in the long run, the achievability and adoption of the e-tendering system is made possible.

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Keywords: *e-procurement, e-tendering, ICT, perceived benefits*

1. Introduction

The world has evolved over the past few years towards the embracement of technology. Institutions all over the world are keen to adopt technological change in their systems to increase efficiency and save time on work done. According to Bialy 2008, e- tendering is done with a software application that includes features for supplier management and complex auctions. The new generation of e- procurement is currently on demand or software as a service (SaaS). E-Tendering is a component that is contained in thee- procurement value chain that comprises of indent management, e- tendering, e- auctioning, vendor management, catalogue management and contract management. Indent management is the workflow involved in the preparation of tenders is an online system by which companies can be connected directly to suppliers for the purpose of buying products and services at the lowest cost possible (Peter, 2012). E-tendering essentially replaces its offline version, called tender. The advantages and disadvantages of e- tendering mostly parallel the universal benefits and disadvantages of the internet.

E- Tendering in the public sector is emerging internationally; hence, initiatives have been implemented in Singapore, UK, USA, Malaysia, Australia and European Union. e- Tendering projects are often part of a country's larger e- Government efforts to better serve its citizen and businesses in the digital economy. The significance of this development is more and more evident in many developing countries of the world. ICT not only facilitates the inner operations of administrative machinery, it also eases communication between various branches of the administration and its dealings with citizens and businesses (Petrie, 2011).

Several changes have taken place in Kenya concerning ICT though not properly through a legal framework over the first 10 years of inception. Notable changes have been formation of the Multi- Stakeholder Kenya ICT Action Network. Through the network, a policy process deemed to be inclusive has been catalyzed, resulting in the country's first draft ICT policy document which was approved by Cabinet in February, 2012, (Republic on Kenya, 2012). Though electronic commerce is viewed as involving many ministries, Communication Commission of Kenya (CCK) is responsible for revitalizing and transforming the economy into modern market oriented through e-commerce (Republic of Kenya, 2014). Many firms in Kenya and world over have registered dismal performance in terms of business growth and profit making because of insufficient and unsustainable procurement procedures. Employees have been fired because of low performance rate persistent lateness and wrong attitude towards work (Johnson, 2008).

2. Statement of the Problem

More than 50% of procurement processes in Kenya public organization are carried out manually. The manual processes are costly, slow, inefficient and data storage and retrieval poor (Malela, 2010). according to e-government strategy paper (2013) e-tendering 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 adoption of e procurement in the public sector raises concern as to what challenges face adoption of e procurement in Kenya.

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3. Objectives of the Study

The general objective of this study was to establish the factors affecting the adoption of e-tendering system among public institutions in Kisii County. The study was guided by the following specific objectives;

i) To assess the extent to which management supports the adoption of e-tendering system among public institutions in Kisii county.

ii) To determine the extent to which perceived benefits affect the adoption of e-tendering system among public institutions in Kisii County

iii) To establish the extent to which employee competence affect the adoption of e-tendering system among public institutions in Kisii County

iv) To establish the extent to which cost of implementation affect the adoption of e-tendering system among public institutions in Kisii County

4. Justification of the Study

This study is important because it is trying to address the contribution of e- tendering on internal customer service. Internal customers are important part of the supply chain and they have great adoption of e-tendering on the external customers and therefore the overall organization's success.

5. Conceptual Framework

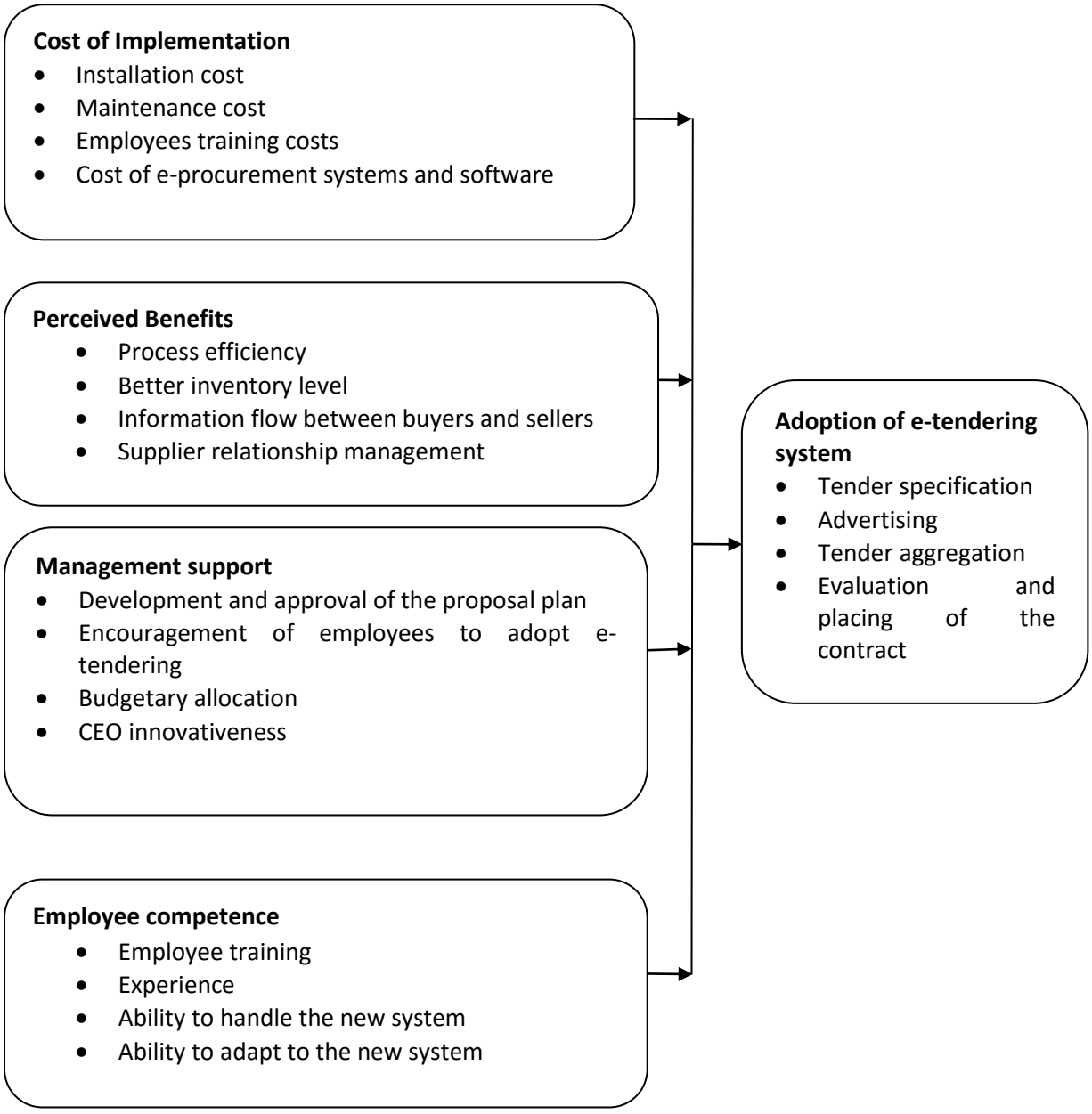

Figure 1: Conceptual Framework

6. Research Methodology

The study used descriptive research design. The target population was 181 management employees at Kisii county public institutions. Stratified proportionate random sampling technique was used to select the sample. From each stratum the study used simple random sampling to select 72 respondents by taking 40% from each group. In this study the researcher employed a questionnaire as the instrument of data collection. Quantitative data collected was

analyzed by the use of descriptive statistics using SPSS. Regression analysis was used to establish the relationship between the variables.

7. RESULTS AND DISCUSSION

8. Cost of Implementation

The study sought to establish the effect of cost determinants on adoption of e-tendering system among public institutions in Kisii County. The results were as shown in the subsequent sections.

Effect of cost of implementation on the adoption of e-tendering system

The respondents were requested to indicate the extent to which they thought the cost determinants affects the adoption of e-tendering system in their offices. Their responses were as shown below.

Table 1: Effect of cost of implementation on the adoption of e-tendering system

	Frequency	Percent
Very great extent	25	38.5
Great extent	21	32.3
Moderate extent	10	15.4
Little extent	9	13.8
Total	**65**	**100.0**

According to the findings tabled above, 38.5% of the respondents indicated that cost determinants affects the adoption of e-tendering system in their offices to a very great extent, 32.3% indicated to a great extent, 15.4% indicated to a moderate extent while 13.8% indicated a little extent. From these findings, we can conclude that cost determinants affect the adoption of e-tendering system to a very great extent. This concurs to Neef (2010) who indicated that process automation of procurement function helps in reduction of cost to firms in various industries. Cost surveys in US have recently revealed what was suspected for some time that by the time a requisition makes its way through a fax and internal mail paper maze of approvals to the central purchasing department, administrative costs – typically run from $ 40 to $150 – often exceed the cost of the purchase itself.

Influence of Aspects of cost of implementation on adoption of e-tendering system

The respondents were further requested to indicate the extent to which the following aspects of cost determinant affect adoption of e-tendering system in their offices. Their responses were as shown below.

Table 2: Influence of Aspects of cost determinant on adoption of e-tendering system

	Mean	Std. Deviation
Installation cost	4.456	0.726
Maintenance cost	4.421	1.075
Employees training costs	4.354	1.118
Cost of e-procurement systems and software	4.222	0.833

From the table above, the respondents indicated that installation costs affect adoption of e-tendering system in their offices to a great extent as shown by a mean score of 4.456. In this connection, cost surveys in US have recently revealed what was suspected for sometime: that by the time a requisition makes its way through a fax and internal mail paper maze of approvals to the central purchasing department, administrative costs – typically run from $ 40 to $150 – often exceed the cost of the purchase itself according to Moorman (2008). Further, the respondents indicated that maintenance cost affect adoption of e-tendering system in their offices to a great extent as shown by a mean score of 4.421. As well, the respondents indicated that employees training costs affect adoption of e-tendering system in their offices to a great extent as shown by a mean score of 4.354. Lastly, the respondents indicated that cost of e-procurement systems and software affect adoption of e-tendering system in their offices to a great extent as shown by a mean score of 4.222. Accordingly, any good e-tendering software system today is designed to greatly reduce the time and effort required to complete purchasing transactions by eliminating our traditional paper chain of requisitions, approvals, receiving and payment reconciliation according to Neef (2010).

9. Perceived Benefits

The study sought to establish the effect of perceived benefits on adoption of e-tendering system among public institutions in Kisii County. The results were as shown below.

Effect of perceived benefits on the adoption of e-tendering system

The respondents were requested to indicate the extent to which they thought the perceived benefits affect the adoption of e-tendering system in their offices. Their responses were as shown below.

Table 3: Effect of perceived benefits on the adoption of e-tendering system

	Frequency	**Percent**
Very great extent	21	32.3
Great extent	25	38.5
Moderate extent	11	16.9
Little extent	8	12.3
Total	**65**	**100.0**

According to the findings tabled above, 38.5% of the respondents indicated that perceived benefits affect the adoption of e-tendering system in their offices to a great extent, 32.3% indicated to a very great extent, 16.9% indicated to a moderate extent while 12.3% indicated a little extent. From these findings, we can deduce that perceived benefits affect the adoption of e-tendering system to a great extent. This concur with Parida (2005) findings that an e-tendering solution provides access to, and easy purchasing from, catalogues of many different suppliers while eliminating paperwork, automating the approval process and enforcing the purchase polices that apply to each Buyers' suppliers.

Influence of aspects of perceived benefits on adoption of e-tendering system

The respondents were further requested to indicate the extent to which the following aspects of perceived benefits affect adoption of e-tendering system in their offices. Their responses were as in the following table 4.

Table 4: Influence of aspects of perceived benefits on adoption of e-tendering system

	Mean	Std. Deviation
Organizational factors	4.546	1.014
Process efficiency	4.125	0.756
Better inventory level	3.806	0.632
Information flow between buyers and sellers	3.667	1.323
Supplier relationship management	3.525	0.834

From the findings above, the respondents indicated that organizational factors affect adoption of e-tendering system in their offices to a very great extent as shown by a mean score of 4.546. Organizations expect cost reduction from e-procurement software to be derived from the additional control over maverick Spending (purchase of goods from suppliers with which the organization does not have formal relationships. Negotiated process based on volumes) and the benefits effects associated with the additional purchase-related information inherited in that technology (Rasheed et al, 2001).

Further, the respondents indicated that process efficiency affects adoption of e-tendering system in their offices to a great extent as shown by a mean score of 4.125. Additionally, the respondents indicated that better inventory level affects adoption of e-tendering system in their offices to a great extent as shown by a mean score of 3.806. The simplification of the purchasing process that e-procurement technologies are credited which also has a favorable impact on the purchasing cycle time (Davila et al, 2002). The system also allows the company's purchasing department around the world to share information about their best suppliers.

As well, the respondents indicated that information flow between buyers and sellers affect adoption of e-tendering system in their offices to a great extent as shown by a mean score of 3.667. Buyers and sellers share information in real time to build specification that add value to resulting product and build strong relation according to Presutti (2002).

Lastly, the respondents indicated that supplier relationship management affect adoption of e-tendering system in their offices to a moderate extent as shown by a mean score of 3.525. Different authors have elaborated on the benefits that accrue from adopting e-procurement

technologies. These benefits are expected to accelerate the rate of adoption of these technologies once the uncertainties that remain around e-procurement are reduced to levels that encourage significant resources commitments leading towards higher process efficiency (Davila et al, 2002).

10. Management support

The study additionally sought to assess the effect of management support on adoption of e-tendering system among public institutions in Kisii County. The results were as shown in the subsequent sections.

Effect of management support on the adoption of e-tendering system

The respondents were requested to indicate the extent to which they thought the management support affects the adoption of e-tendering system in their offices. Their responses were as shown in the following table.

Table 5: Effect of management support on the adoption of e-tendering system

	Frequency	Percent
Very great extent	19	29.2
Great extent	28	43.1
Moderate extent	10	15.4
Little extent	8	12.3
Total	**65**	**100.0**

According to the findings tabled above, 43.1% of the respondents indicated that management support affects the adoption of e-tendering system in their offices to a great extent, 29.2% indicated to a very great extent, 15.4% indicated to a moderate extent while 12.3% indicated to a little extent. From these findings, we can infer that management support affects the adoption of e-tendering system to a great extent. The most important factor when adopting e-tendering is the top level management's commitment to the strategic direction itself. This is undoubtedly a prerequisite for strategy adoption. Therefore, top managers must demonstrate their willingness to give energy and loyalty to the e-tendering process as Alexander (2005) postulated.

Influence of aspects of management support on adoption of e-tendering system

The respondents were further requested to indicate the extent to which the following aspects of management support affect adoption of e-tendering system in their offices. Their responses were as shown below.

Table 6: Influence of aspects of management support on adoption of e-tendering system

	Mean	Std. Deviation
Development and approval of the proposal plan	4.400	0.547
Budgetary allocation	3.908	1.286
Encouragement of employees to adopt e-tendering	3.888	1.167

Top management support is necessary for any strategic program success (Hamel &Prahalad, 1989; Zhu & Sarkis, 2007). According to the findings tabled above, the respondents indicated that development and approval of the proposal plan affects adoption of e-tendering system in their offices to a great extent as shown by a mean score of 4.400. Further, the respondents indicated that budgetary allocation affects adoption of e-tendering system in their offices to a great extent as shown by a mean score of 3.908. Lastly, the respondents indicated that encouragement of employees to adopt e-tendering affect adoption of e-tendering system in their offices to a great extent as shown by a mean score of 3.888. Top management provides continuous support for technological implementation and action plans for successfully implementing them (Ravi and Shankar, 2005). Therefore, we assume that lack of top management support is one of the barriers to adopt e-tendering systems in public institutions.

11. Employee competence

The study as well sought to establish the effect of employees' competence on adoption of e-tendering system among public institutions in Kisii County. The responses were as shown below.

Effect of management support on the adoption of e-tendering system

The respondents were requested to indicate the extent to which they thought the employees' competence affects the adoption of e-tendering system in their offices. Their responses were as shown in the following table 7.

Table 7: Effect of management support on the adoption of e-tendering system

	Frequency	Percent
Very great extent	27	41.5
Great extent	20	30.8
Moderate extent	10	15.4
Little extent	8	12.3
Total	**65**	**100.0**

According to the findings tabled above, 41.5% of the respondents indicated that management support affects the adoption of e-tendering system in their offices to a very great extent, 30.8% indicated to a great extent, 15.4% indicated to a moderate extent while 12.3% indicated to a little extent. From these findings, we can infer that employees' competence affects the adoption of e-tendering system to a great extent. ICT knowledge of public institutions staff also positively affects ICT adoption and use as Sigala (2003a) put it.

Influence of aspects of employee's competences on adoption of e-tendering system

The respondents were further requested to indicate the extent to which the following aspects of employees' competence affect adoption of e-tendering system in their offices. Their responses were as shown below.

Table 8: Influence of aspects of employees' competence on adoption of e-tendering system

	Mean	Std. Deviation
Employee training	3.667	1.225
Experience	3.556	1.333
ability to handle the new system	3.525	1.080
quickly adapt to the new system	3.512	1.414

From these findings tabled above, the respondents indicated that employee training affects adoption of e-tendering system in their offices to a very great extent as shown by a mean score of 3.667. Additionally, the respondents indicated that experience affects adoption of e-tendering

system in their offices to a great extent as shown by a mean score of 3.556. This tally with Lewis and Roehrich (2009) who observed that competency should be emphasized by the organization when outsourcing for new employees for the new system. Experience and ability to handle the new system as well as to quickly adapt to the new system should be among the factors the human resource department should put into consideration when making their selection

Further, the respondents indicated that ability to handle the new system affects adoption of e-tendering system in their offices to a moderate extent as shown by a mean score of 3.525. Lastly, the respondents indicated that the ability to quickly adapt to the new system affects adoption of e-tendering system in their offices to a little extent as shown by a mean score of 3.512. Amaratunga and Baldry (2013) agree stating that to ensure that all individuals within the organization are well versed with the newly introduced ICT applications in the procurement process, management of the organization should emphasize on employee training and induction to ensure that they (employees) are well equipped with the necessary required skills to handle the new system with accuracy.

12. Measures of E-Tendering Adoption

The respondents were additionally requested to indicate the extent to which their institution has been adopting E-tendering for the following functions in the last five years. Their responses were as shown in the following table 9.

Table 9: Measures of E-Tendering Adoption

	Mean	Std. Deviation
Tender specification	4.506	0.699
Advertising	4.173	0.866
Tender aggregation	4.111	0.782
Evaluation and placing of the contract	4.094	1.010

According to the findings tabled above, the respondents indicated that tender specification affects adoption of e-tendering system in their offices to a very great extent as shown by a mean score of 4.506. Further, the respondents indicated that advertising affects adoption of e-tendering system in their offices to a great extent as shown by a mean score of 4.173. As well, the respondents indicated that tender aggregation affects adoption of e-tendering system in their

offices to a moderate as shown by a mean score of 4.111. Lastly, the respondents indicated that evaluation and placing of the contract affects adoption of e-tendering system in their offices to a little extent as shown by a mean score of 4.094. This is similar to Turban et al, (2012) findings that E- tendering essentially replaces its offline version, called tender. The advantages and disadvantages of e- tendering mostly parallel the universal benefits and disadvantages of the internet.

13. Regression Analysis

In this study, a multiple regression analysis was conducted to test the influence among predictor variables. The research used statistical package for social sciences (SPSS V 21.0) to code, enter and compute the measurements of the multiple regressions.

Table 10: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.809	0.655	0.632	0.160

Table 10 is a model fit which establish how fit the model equation fits the data. The study found that R was 0.809. Therefore, the multiple correlation coefficient between all the predictors (perceived benefits, management support and employee competence) in the model and the adoption of e-tendering system in Kisii County was 0.809. The R^2 was used to establish the predictive power of the study model and it was found to be 0.655 implying that 65.5% of the variations in adoption of e-tendering system among public institutions in Kisii County are explained by cost determinants, perceived benefits, management support and employee competence leaving 34.5% percent unexplained. Therefore, further studies should be done to establish the other factors (34.5%) affecting knowledge management capabilities on the adoption of e-tendering system among public institutions in Kisii County in Kenya. It was also established that adjusted R Square was 0.632, this indicates, after adjusting for the complexity of the model, then the model accounts for 63.2% of the total variability. This improves the ability of the predictors to explain the dependent variable as it yields a more honest value as the increase in R

Square could be as a result of chance. Therefore, the model explains 63.2% of the variations in adoption of e-tendering system among public institutions in Kisii County.

Table 11: ANOVA results

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	3.041	4	0.760	28.438	0.0289
1	Residual	1.604	60	0.027		
	Total	4.645	64			

The probability value of 0.0289 indicates that the regression relationship was highly significant in predicting how cost determinants, perceived benefits, management support and employee competence affected adoption of e-tendering system among public institutions in Kisii County ($P<0.05$). The F calculated at 5 percent level of significance was 28.438 since F calculated is greater than the F critical (value = 2.53), this shows that the overall model was significant.

Table 12: Coefficients of Determination

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	1.672	0.516		3.240	0.00195
	Cost determinants	0.703	0.223	0.146	3.152	0.00253
1	Perceived Benefits	0.643	0.191	0.126	3.366	0.00133
	Management support	0.847	0.274	0.045	3.091	0.00302
	Employee competence	0.496	0.157	0.142	3.159	0.00248

The established model for the study was:

$Y = 1.672 + 0.703 X_1 + 0.643 X_2 + 0.847 X_3 + 0.496 X_4$

The regression equation above has established that taking all factors into account (cost determinants, perceived benefits, and management support and employee competence) constant at zero adoption of e-tendering system among public institutions in Kisii County was 1.672. The findings presented also show that taking all other independent variables at zero, a unit increase in the cost determinants would lead to a 0.703 increase in the scores of adoption of e-tendering system among public institutions in Kisii County and a unit increase in the scores of perceived benefits would lead to a 0.643 increase in the scores of adoption of e-tendering system among public institutions in Kisii County. Further, the findings shows that a unit increases in the scores of management support would lead to a 0.847 increase in the scores of co adoption of e-tendering system among public institutions in Kisii County. The study also found that a unit increase in the scores of employee competence would lead to a 0.496 increase in the scores of adoption of e-tendering system among public institutions in Kisii County. Overall, management support had the greatest effect on the adoption of e-tendering system among public institutions in Kisii County, followed by cost determinants, and then perceived benefits while employee competence had the least effect to the adoption of e-tendering system among public institutions in Kisii County.

At 5% level of significance and 95% level of confidence, cost determinants had a 0.00253 level of significance, perceived benefits showed a 0.00133 level of significance, management support had a 0.00302 level of significance, and employee competence had a 0.00248 level of significance hence the most significant factor is management support. As per the results above, all the variables were significant P value ($p<0.05$). This therefore indicates that the beta coefficients for cost determinants, perceived benefits, management support and employee competence (i.e. 0.703, 0.643, 0.847 and 0.496 respectively) are statistically significant from zero. The four factors can therefore be relied upon to predict adoption of e-tendering system among public institutions in Kisii County.

14. Summary of Findings

The study established that cost determinants affects the adoption of e-tendering system to a very great extent. The study further established that installation costs, maintenance cost, employees

training costs and cost of e-procurement systems and software affect adoption of e-tendering system to a great extent.

The study established that perceived benefits affect the adoption of e-tendering system to a great extent. The study also established that organizational factors, process efficiency, better inventory level, information flow between buyers and sellers and that supplier relationship management affect adoption of e-tendering system to a great extent.

The study established that management support affects the adoption of e-tendering system to a great extent. Additionally, the study established that development and approval of the proposal plan, budgetary allocation and encouragement of employees to adopt e-tendering affect adoption of e-tendering system to a great extent.

The study further established that employees' competence affects the adoption of e-tendering system to a great extent. In addition, the study established that employee training, experience, ability to handle the new system and the ability to quickly adapt to the new system affect adoption of e-tendering system in their offices to a great extent.

On this, the study established that tender specification, advertising, tender aggregation and evaluation and placing of the contract affects adoption of e-tendering system in their offices to a great extent.

15. Conclusion

The study concludes that cost determinants affects the adoption of e-tendering system to a very great extent. The study further concludes that installation costs, maintenance cost, employees training costs and cost of e-procurement systems and software affect adoption of e-tendering system to a great extent.

The study also concludes that perceived benefits affect the adoption of e-tendering system to a great extent. The study also concludes that organizational factors, process efficiency, better inventory level, information flow between buyers and sellers and that supplier relationship management affect adoption of e-tendering system to a great extent.

The study further concludes that management support affects the adoption of e-tendering system to a great extent. Additionally, the study concludes that development and approval of the proposal plan, budgetary allocation and encouragement of employees to adopt e-tendering affect adoption of e-tendering system to a great extent.

The study concludes that employees' competence affects the adoption of e-tendering system to a great extent. In addition, the study concludes that employee training, experience, ability to handle the new system and the ability to quickly adapt to the new system affect adoption of e-tendering system in their offices to a great extent.

16. Suggestion for Further Studies

The study recommends that a similar study should also be done on other public institutions since their operations are different from those of public organizations. Further studies should be done on other counties to find out whether it will yield the same information.

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