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**ABSTRACT**

*The study sought to establish factors that influence the implementation of e-procurement in public technical vocational education and training institutions in Kenya. This study was informed by the Technology Acceptance Model (TAM), Technology, Organization and Environment model and Electronic Data Interchange (EDI) Adoption Model. The study employed cross-sectional research design and targeted 86 Public Technical Vocational Education and Training institutions in Kenya. Closed and open ended questionnaires were distributed to heads of procurement functions in the institutions. Descriptive statistics, correlation and multiple regression analysis were used to analyze the data. The results of the study revealed that Technological factors had a positive and statistically significant influence on the implementation of e-procurement in Public Technical Vocational Education and Training institutions in Kenya. The results further indicated that organizational factors had a positive and statistically significant influence on implementation of e-procurement in Public Technical Vocational Education and Training institutions in Kenya. However, environmental and financial factors were found not to have statistically significant influence on the implementation of e-procurement in these institutions. Additionally, the results indicated that the joint influence of technological, organizational, environmental and financial factors had a statistically significant influence on the implementation of e-procurement in Public Technical Vocational Education and Training institutions in Kenya. This study recommended for enhanced technological and organizational support for effective implementation of e-procurement in public institutions. This study had implications to knowledge and practice since it had not only evaluated the robustness of the Technology Acceptance Model in assessing factors that influence e-procurement implementation but also informed that organizational and technological factors were the most dominant factors hindering effective implementation of e-procurement in these institutions.*

**Key Words:** E-Procurement, Technological Factors, Organizational Factors, Environmental Factors, Financial Factors

## INTRODUCTION

In a networked society, as citizens become technologically savvy, consumers of services through digital media, expect a similar experience when it comes to public services (Teo & Lai, 2009). However, the literature and evidence show that some public institutions have lagged behind in the adoption of new technologies (Grilo & Jardim-Goncalves, 2011; Okongo, 2016). This is not any different in the Kenyan context where in spite of the widespread organizational adoption of e-government systems, many public entities continue to witness disappointing performance outcomes in their implementation (Okongo, 2016). This can be explained largely by the failure of many organizations to translate the initial adoption decision, made at an organizational level, into individual-level acceptance of e-procurement by an organization's employees.

Particularly, Electronic procurement (e-procurement), which 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 (Wamae, 2014), continue to witness disappointing performance results in its implementation in many public entities. These limitations contrast with the growing number of countries and regions pursuing some form of e-government to develop and deliver high quality, seamless and integrated public services, to redefine and improve their government-constituency relationships, and to provide a better support for local, national or international development (Grant & Chau, 2006).

While there are various forms of e-procurement that concentrate on one or many stages of the procurement process such as e-tendering, e-marketplace, e-auction/reverse auction, and e-catalogue/purchasing, e-procurement can be viewed more broadly as an end-to-end solution that integrates and streamlines many procurement processes throughout the organization, Businesses

have realized that time and cost savings can be achieved by having a link with major suppliers through private networks such as electronic data interchange (Gunasekaran & Ngai 2008).

There is no doubt that the e-business is drastically changing the way procurement is done globally. The rise 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 (Lancioni, Smith & Oliva, 2000). The advent of the internet as a business systems platform has been a 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.*, (2001), the majority of organizational spending consists of purchasing. In order to decrease the total costs spent on purchasing process, internet technologies are used and e-procurement has become popular to implement in the latest era by both governments and enterprises.

Ageshin (2001) studied the drawback of E-procurement; buyers who adopt e-procurement rely on suppliers on the implementation of just-in-time practices. Because of this, there is an increase in the involvement of suppliers in product design and development, shorter ordering cycles. Suppliers are disinclined to e-procurement for the reason of costs involved in training the staff and the risk involved in sharing the business data. According to Gupta and Narain (2011), E-procurement offers a range of benefits but its adoption rate is low. An investigation was conducted in Indian organizations about the electronic procurement adoption and the effect of electronic procurement in these organizations. From the study, it was identified that, the objective of e-procurement is to provide customer satisfaction, to produce good producers, to improve performance and product quality delivery of goods in time. The study indicated that the barriers for e-procurement adoption were the effect of e-procurement on performance measures.

According to Technical and Vocational Education and Training Authority (TVETA) (2017), there are 86 public Technical Vocational Education and Training Institutions in Kenya which operate under the auspices of the authority. TVETA is a State Corporation established under the Technical and Vocational Education and Training (TVET) Act, 2013 that was Publicized in a Special Issue of the Kenya Gazette Supplement No. 44 (Acts No. 29) on 25<sup>th</sup> January 2013 and commenced on 24<sup>th</sup> June 2013. The mandate of the Authority is to regulate TVET sector through Licensing, Registration and Accreditation of institutions, programs and trainers. Just like any other public entity, procurement in the public Technical Vocational Education and Training Institutions is regulated by the Public Procurement and Asset Disposal Act (2015). An audit report done by the office of the auditor general reveals that e-procurement implementation lags behind in these institutions and this has led to huge loss of taxpayers' money. A survey done by the TVETA (2016), also established that Technical and Vocational Education and Training Institutions have not yet effectively embraced E-procurement practices because they have not put measures in place on how to manage factors affecting effective implementation. The report further revealed that E-procurement projects in some of Technical Vocational Education and Training institutions have been notoriously unsuccessful. Moreover, a study by Okongo (2016) found that implementation of information technology within public institutions has had an impact on the enhancement of the provision of services by 40%, and as such, the necessity to improve the effectiveness of service provision by the adoption of a well coordinated, automated operation. In addition, literature is replete with studies which underline varied edges of migration of procurement functions to web.

### **Statement of the Problem**

Despite the improving statistics witnessed in the implementation of electronic procurement in

various public sector in Kenya (RoK, 2017, Njeru, 2015), literature is replete with studies on disappointing implementation in public Technical and Vocational Education and Training institutions (Okongo, 2016; Korir, 2009, Kinoti, 2013; GoK, 2011, Aman & Kasimin, 2011) whereby majority of these institutions continue to employ "manual" procurement approaches. Astoundingly, research has hardly been done to establish factors that influence the implementation of e-procurement in public Technical Vocational Education and Training institutions in Kenya.

A review of literature had established that studies done in the area of e-procurement implementation are conceptual in nature, while others are purely dependent on subjective data-which does not allow generalizability (Ongisa, 2015, Okongo, 2016, Korir, 2009, Mose, 2015). Further, a review of literature revealed that there existed a contextual gap since most of the studies had been done in developed countries-whose findings may not be applicable in a developing country set up like Kenya. The studies indicated that there were country-specific differences in the Implementation of E-Procurement. It is on the basis of these differences that the study sought to examine the factors that influenced implementation of E-Procurement in Public Technical Vocational Education and Training Institutions in Kenya.

### **Objective of the Study**

The general objective of the study was to investigate factors influencing implementation of electronic procurement in Public Technical Vocational Education and Training Institutions in Kenya. The specific objectives of the study were:-

- To establish the influence of technological factors on implementation of electronic procurement in Public Technical Vocational Education and Training Institutions in Kenya
- To examine the influence of organizational factors on implementation of electronic

procurement in Public Technical Vocational Education and Training Institutions in Kenya

- To find out the influence of environmental factors on implementation of electronic procurement in Public Technical Vocational Education and Training Institutions in Kenya
- To determine the influence of financial factors on implementation of electronic procurement in Public Technical Vocational Education and Training Institutions in Kenya

### Research Hypothesis

- **H<sub>01</sub>:** Technological factors have no significant influence in implementation of electronic procurement in Public Technical Vocational Education and Training Institutions in Kenya.
- **H<sub>02</sub>:** Organization factors have no significant influence in implementation of electronic procurement in Public Technical Vocational Education and Training Institutions in Kenya.
- **H<sub>03</sub>:** Environmental factors have no significant influence in implementation of electronic procurement in Public Technical Vocational Education and Training Institutions in Kenya.
- **H<sub>04</sub>:** Financial Factors has no significant influence in implementation of electronic

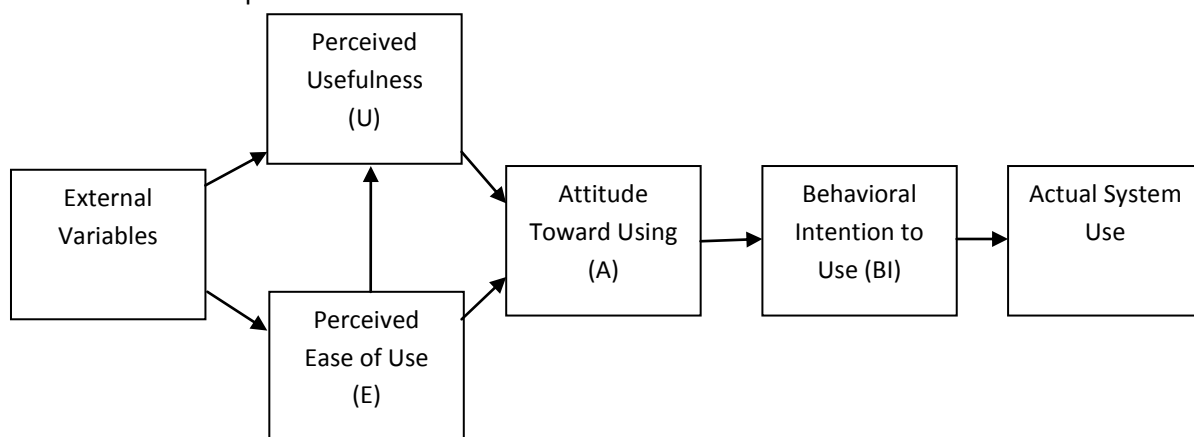
procurement in Public Technical Vocational Education and Training Institutions in Kenya.

## LITERATURE REVIEW

### Theoretical Review

#### Technology Acceptance Model (TAM)

According to Davis (1989), the Technology Acceptance Model (TAM) is an information systems model that explains how users come to accept and use a technology. The model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it, notably: perceived usefulness (PU) – "the degree to which a person believes that using a particular system would enhance his or her job performance and perceived ease-of-use (PEU) – "the degree to which a person believes that using a particular system would be free from effort" (Davis 1989). TAM has been effective for explaining many kinds of systems (Fathema & Sutton, 2013; Fathema, Shannon & Ross, 2015, Fathema, Ross & Witte, 2014). The following Figure 2.1 shows the conceptual model for TAM:



**Figure 2.1: Technology Acceptance Model (TAM) (Source: Hamad (2014))**

According to Hamad (2014), the Technology Acceptance Model (TAM) was used to determine the factors causing the adoption of IT to be either accepted or rejected. The original version of the technology acceptance model (TAM) is an adaptation 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.

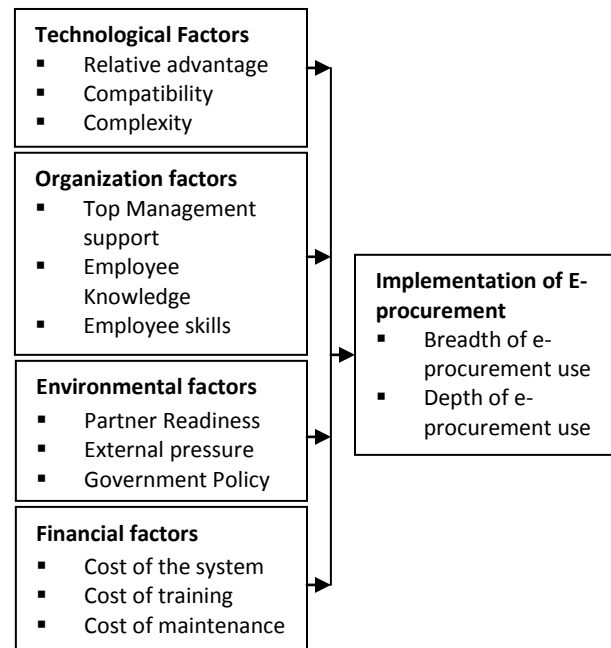
## Technology, Organization and Environment (TOE) Framework

The TOE framework was developed in 1990 (Tornatzky & Fleischer, 1990). It identifies three aspects of an enterprise's context that influence the process by which it adopts and implements a technological innovation; technological context, organizational context, and environmental context (Figure 2.2). The Technological context describes both the internal and external technologies relevant to the firm. This includes current practices and equipment internal to the firm (Starbuck, 1976), as well as the set of available technologies external to the firm (Thompson 1967; Khandwalla 1970; Hage, 1980). On the other hand, the organizational context refers to descriptive measures about the organization such as scope, size and managerial structure while the environmental context is the arena in which a firm conducts its business—its industry, competitors, and dealings with the government (Tornatzky & Fleischer, 1990).

## Electronic Data Interchange (EDI) Adoption Model

Iacovou, Benbasat and Dexter (1995) analyzed inter-organizational systems (IOSs) characteristics that influence firms to adopt IT innovations in the context of EDI adoption. Their framework is well suited to explain the adoption of an IOS. It is based on three factors: perceived benefits, organizational readiness, and external pressure (see Figure 2.3). Perceived benefits are a different factor from the TOE framework, whereas organizational readiness is a combination of the technology and organization context of the TOE framework. Hence, IT resources are similar to technology context and financial resources are similar to organizational context.

## Conceptual Framework



**Independent Variables      Dependent Variable**

**Figure 1: conceptual Framework**

Source: Author (2018)

## Empirical Review

Bulut and Yen (2013) found that e-tendering is mainly used to accommodate the requirements of the government sector units. Government sector units make use of e-journals to advertise tender notices rather than publishing newspaper advertisements. This strategy helps in the grant of contracts of high costs with a benefit of saving prices usually spent on advertisements in newspapers. E-journal is mainly used to advertise tender, filling up tender documents or to get them from the website in terms of soft copy format. As per a report by World Bank (2003), e-tendering solutions are complicated and typically include numerous modules like tender procedure, decision on tender applications, document preparation for tender, e-journal is used for issue of notices regarding tender which includes bidder's registration and document shipping, preparation of bid with a digital signature and at last submission of application analysis of bids. E-procurement methods normally provide solutions for electronic purchase of goods and services, but e-tendering is

designed to digitally manage the tendering procedure.

Karjalainen and Raaij (2011) discussed some proactive influence which encourages the electronic procurement adoption. For example, different ways of providing summaries as per the demand of a genuine work, teamwork, influential recommendation, management request, appraisal and control. Schoenherr and Tummala (2008) in their study on E-procurement solutions employed in government undertakings reported the details of tender opportunities, solutions like e-catalogue, e-tendering, e-auction and e-marketplace.

Basheka and Bisangabasaija (2010) believed that initially e-procurement was used by non-public sector but later attracted the government sector. The important aspect for adoption of e-procurement in developed countries is better administration. E-procurement is used to fight corruption in underdeveloped countries where the corruption rate is high. Government procurement accounts for 20 percent of public spending. In some African countries, this will amount to as high as 70%. A reduction in public spending by as little as 1% will make a big difference by releasing huge amount of people's money.

Greunen *et al.*, (2010) focused on adoption of E-procurement by government agencies and the method of remodeling procurement practices in accordance with national economic strategy. In order to deal with various socio economic challenges, government is switching to technology to deal with issues like obsolete procurement practices. E-procurement provides the introduction of internationally accepted best practices to facilitate the government to deliver on its mandate. From the background of South African legislation that governs the procurement practices in accordance with national economic development initiatives is the main insight of this study. The study explains how best Japanese Cape Provincial Administration succeeded in achieving the national and provincial socio economic growth objectives.

Reports and other primary sources of information were used, and expert interviews were conducted to answer these queries. It was found that measurable benefits of supply chain management haven't been completed owing to general restricted understanding and how the supply chain management conception works at government surroundings. Other limitations are lack of understanding within the execution of policy and legal framework that govern obsolete procurement, desperate procurement systems and ICT infrastructure.

Thai and Grimm (2000) found that the implementation of e-procurement initiatives should be seen as an effort to improve the procurement goals, which normally include quality, timeliness, cost minimizing, business's financial and technical risks, maximizing competition, and maintaining integrity. Brack (2000) found out that buyers indicated that the conversion from paper-based to e-purchasing resulted in a reduction of purchasing cost, reduction in inventory level, a 5-day reduction in cycle time and a US\$77 saving per requisition administrative cost.

According to Attaran (2012) in the international context, it will be necessary to gain a competitive advantage in the future and use of internet is becoming the necessary condition of doing businesses in the global market. Electronic ordering appears to be the trend for the future. With all the benefits that web-based procurement offers, it would seem that eventually every industry would turn to it. The reduction of paperwork, less errors, accurate information, better inventory management, as well as quicker delivery times, all lead us to believe that it's just a matter of time when every company will employ this technology. The aim of this paper was to identify tips for IT managers for successful implementation of the technology. Study found that the internet based technology gives companies an opportunity to gain a competitive advantage. The proper implementation of such technology is a key management issue. To make this technology

successful, IT managers must work to a plan and lay technology groundwork. They must believe in the benefits of this technology, opt for a comprehensive approach, define new relationships with vendors, train and support suppliers, and openly communicate with employees. The employees play an equally important role in the success of this technology. To prepare workers for their new roles, management needs to begin an education and training program.

### METHODOLOGY

After considering the various research designs described by research experts like Zikmund (2003), Cooper (2001), Mugenda and Mugenda (1999), as well as the purpose of the study, the topical scope, researcher involvement, time period over which the data was to be collected, the nature of data that was collected and the type of analysis that were to be performed, the research design that was adopted for this study was cross-sectional research design. The target population for this study comprised of a total of 86 Public Technical Vocational Education and Training Institutions in Kenya. According to inspectorate of state corporations of Kenya (2012), Technical Vocational Education and Training Institutions in Kenya are 86 spread in eight regions. The targeted respondents comprised of heads of procurement functions of Public Technical Vocational Education and Training Institutions in Kenya. This study collected both primary and secondary data. According to Morris (2001), data collection procedure is the process of gathering pieces of information that are necessary for research process. Primary data represents the actual information that was obtained for the

**Table 1: Technological Factors**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all	3	4.2	4.2	4.2
	Small extent	7	9.9	9.9	14.1
	Moderate extent	12	16.9	16.9	31.0
	Large extent	30	42.3	42.3	73.2
	Very large extent	19	26.8	26.8	100.0
	<b>Total</b>	<b>71</b>	<b>100.0</b>	<b>100.0</b>	

purpose of the research study. Pilot study was conducted to test the reliability and validity of the questionnaire. Descriptive statistics method was used to analyze quantitative data where data was scored by calculating the percentages, mean, STD deviation and Variance. This was done using Statistical Package for Social Sciences (SPSS) computer software. The following regression analysis was used to determine with statistical significance, the influence or effect that the independent variables have in the dependent variable.

$$Y = \beta_0 + \beta_i X_i + e \quad (i=1, 2, 3, 4);$$

Where;

$\beta_0$  = Constant

Y = Implementation of E-procurement

$X_1$  = Technological factors

$X_2$  = Organizational Factors

$X_3$  = Environmental Factors

$X_4$  = Financial Factors

$\beta_i$  = Coefficients of regression for the independent variables  $X_i$  (for  $i = 1, 2, 3, 4$ )

e. = error term

### RESULTS AND DISCUSSION

#### Descriptive statistics

The first variable of the study sought to analyze whether technological factors influence implementation of e-procurement in public technical vocational education and training institutions in Kenya. Results were presented in table 1.



The second variable of the study sought to analyse the influence of organizational factors in implementation of e-procurement in public

technical vocational education and training institutions in Kenya. The descriptive statistics were Table 2.

**Table 2: Organizational Factors**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all	3	4.2	4.2	4.2
	Small extent	3	4.2	4.2	8.5
	Moderate extent	8	11.3	11.3	19.7
	Large extent	24	33.8	33.8	53.5
	Very large extent	33	46.5	46.5	100.0
<b>Total</b>		<b>71</b>	<b>100.0</b>	<b>100.0</b>	

The third variable of the study examined the influence of environmental factors on implementation of e-procurement in procurement

in public technical vocational education and training institutions in Kenya. Descriptive statistics were in table 3.

**Table 3: Environmental Factors**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all	5	7.0	7.0	7.0
	Small extent	6	8.5	8.5	15.5
	Moderate extent	12	16.9	16.9	32.4
	Large extent	19	26.8	26.8	59.2
	Very large extent	29	40.8	40.8	100.0
<b>Total</b>		<b>71</b>	<b>100.0</b>	<b>100.0</b>	

The fourth variable sought to analyse the influence of financial factors on adoption of e-procurement in public technical vocational education and training

institutions in Kenya. The descriptive statistics were in Table 4.

**Table 4: Financial Factors**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all	3	4.2	4.2	4.2
	Small extent	3	4.2	4.2	8.5
	Moderate extent	8	11.3	11.3	19.7
	Large extent	29	40.8	40.8	60.6
	Very large extent	28	39.4	39.4	100.0
<b>Total</b>		<b>71</b>	<b>100.0</b>	<b>100.0</b>	

The fifth variable of the study (dependent variable) sought to assess the implementation of e-procurement in public technical vocational education and training institutions in Kenya using

the depth and breadth of the implementation measures. The composite descriptive statistics were in table 5.

**Table 5: E-procurement implementation**

		Frequency	Percent	Valid Percent	Cumulative Percent
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Valid	Not at all	29	40.8	40.8	40.8
	Small extent	28	39.4	39.4	80.3
	Moderate extent	8	11.3	11.3	91.5
	Large extent	3	4.2	4.2	95.8
	Very large extent	3	4.2	4.2	100.0
	<b>Total</b>	<b>71</b>	<b>100.0</b>	<b>100.0</b>	

### Inferential Statistics

A correlation matrix was run in order to identify the existence of relationship between the variables. Pearson Product Moment Correlation coefficient was used for the correlation analysis; the (r) was used to determine the linear relationship between the variables of interest to the study, the (r<sup>2</sup>) coefficient of determination was equally meant to identify the goodness of fit. The correlation coefficient (r) yielded a statistic that varied in ranges in value from -1 to 1 (Mugenda, 2003). A

zero value of 'r' indicates that there was no association between the two variables. When r = (+) 1, it indicates perfect positive correlation and when it is (-) 1, it indicates perfect negative correlation, meaning thereby that variations in independent variable explain 100% of the variations in the dependent variable. It also means that a unit change in independent variable, if there happens to be a constant change in the dependent variable in the same direction, correlation will be perfect positive (Kothari, 2004).

**Table 6: Correlation Matrix for the Study Variables**

		Implementation of E-procurement	Technological Factors	organizational factors	environmental factors	Financial Factors
Implementation of E-procurement	Pearson Correlation	1	.315**	.551**	.143	.551**
	Sig. (2-tailed)		.008	.000	.236	.000
	N	71	71	71	71	71
Technological Factors	Pearson Correlation	.315**	1	.326**	.060	.326**
	Sig. (2-tailed)	.008		.005	.622	.005
	N	71	71	71	71	71
organizational factors	Pearson Correlation	.551**	.326**	1	-.054	1.000**
	Sig. (2-tailed)	.000	.005		.656	0.000
	N	71	71	71	71	71
environmental factors	Pearson Correlation	.143	.060	-.054	1	-.054
	Sig. (2-tailed)	.236	.622	.656		.656
	N	71	71	71	71	71
Financial Factors	Pearson Correlation	.551**	.326**	1.000**	-.054	1
	Sig. (2-tailed)	.000	.005	0.000	.656	
	N	71	71	71	71	71

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

## Regression Analysis of the Independent Variables and Dependent Variable

The study used multiple regression analysis to determine the linear statistical relationship between the independent, moderating and dependent variables of the study. The four null hypothesis of the study were tested using linear regression models. F-test was used to test the validity of the model, while 'r<sup>2</sup>' was meant to measure the model's goodness of fit. The regression coefficient was used to describe the results of regression analysis and outline the nature and intensity of the relationships between the variables under study.

The study specifically sought to establish the effect of Technological Factors on adoption of e-procurement. Results from the analysis of variance, showed that Technological Factors as a unified variable was a valid predictor in the model. It showed that there is a weak positive linear relationship between Technological Factors and implementation of e-procurement. It implied that, one (1) unit increase in the dimension of Technological Factors leads to an increase of 0.143 in implementation of e-procurement.

The study hypothesized H<sub>01</sub>: There is no significant relationship between Technological Factors and the implementation of e-procurement. The results of the survey revealed that there was positive relationship between Technological Factors and the implementation of e-procurement. The null Hypothesis that there is no significant relationship between Technological Factors and the adoption of e-procurement was therefore rejected and concluded that technological factor (X<sub>1</sub>) significantly influences implementation of e-procurement (Y).

The second objective of the study was to establish the effect of organizational factors on implementation of e-procurement. The results showed that organizational factors is a valid predictor in the model. The results showed that there is a strong positive linear relationship

between organizational factors and Implementation of E-Procurement. It implied that, One (1) unit increase in the dimension of organizational factors leads to an increase of 0.256 in the Implementation of E-Procurement. The study hypothesized H<sub>02</sub>: There is no significant relationship between organizational factors and the Implementation of E-Procurement. The results of the survey revealed that there was positive relationship between organizational factors and the Implementation of E-Procurement. The null Hypothesis(H<sub>02</sub>; β<sub>2</sub>=0) that there is no significant relationship between organizational factors and the Implementation of E-Procurement was therefore rejected and concludes that organizational factor (X<sub>2</sub>) significantly influences implementation of E-Procurement (Y).

The third objective of the study was to establish the effect of environmental factors on Implementation of E-Procurement. The results showed that there is a weak positive linear relationship between environmental factors and Implementation of e-procurement. The study failed to reject the null hypothesis (H<sub>03</sub>) since the model was not significant.

The fourth and last objective of the study sought to establish the effect of financial factors on Implementation of E-Procurement. The results implied that organizational factors is a not a valid predictor in the model. The study failed to reject the null hypothesis (H<sub>04</sub>) since the model was not significant.

A regression analysis was run in order to assess the joint influence of factors on implementation of e-procurement practices. The study used multiple regression analysis to establish the joint effects of the study variables: Technological Factors (X<sub>1</sub>), organizational factors(X<sub>2</sub>), environmental factors (X<sub>3</sub>) and financial factors (X<sub>4</sub>) on the dependent variable, implementation of e-procurement (Y). To test the hypothesis, the following model was fitted:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e$$

Results showed that the regression model was significant (F (4, 66) = 9.119, p-value=0.000<0.05)

implying that Technological Factors ( $X_1$ ), organizational factors( $X_2$ ), environmental factors ( $X_3$ ) and financial factors ( $X_4$ ) were valid predictors of e-procurement implementation. The value of  $r$  and  $r^2$  were 0.597 and 0.356 respectively. The  $r$  value of 0.597 showed that there is a positive linear relationship between Technological Factors ( $X_1$ ), organizational factors( $X_2$ ), environmental factors ( $X_3$ ) and financial factors ( $X_4$ ) and Implementation of

E-Procurement. The  $r^2$  value indicated that the explanatory power of the Technological Factors ( $X_1$ ), organizational factors( $X_2$ ), environmental factors ( $X_3$ ) and financial factors ( $X_4$ ) (as a variables) was 0.356. This means that 35.6 % of the variation in the implementation of E-Procurement factors was explained by the model.

$$Y = 2.616 + 0.061X_1 + 0.239X_2 + 0.079X_3 - 0.036X_4 + e.$$

**Table 7: Multiple Regression model on Implementation of E-Procurement**

a) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.597 <sup>a</sup>	.356	.317	.40713

a. Predictors: (Constant), Financial Factors, organizational factors, environmental factors, Technological Factors

b) ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.046	4	1.512	9.119	.000 <sup>b</sup>
	Residual	10.940	66	.166		
	Total	16.986	70			

a. Dependent Variable: Implementation of E-Procurement

b. Predictors: (Constant), Financial Factors, organizational Factors, Environmental Factors, Technological Factors.

c) Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	2.616	.326		8.022	.000
	Technological Factors	.061	.048	.135	1.285	.203
	Organizational factors	.239	.049	.514	4.904	.000
	Environmental factors	.079	.047	.167	1.679	.098
	Financial Factors	-.036	.048	-.076	-.763	.448

a. Dependent Variable: Implementation of E-Procurement

**Table 8: Summary of Research Objectives and Hypothesis Tested**

S/no	Objective	Hypothesis tested	P-value	Remarks
1)	To establish the influence of technological factors on implementation of electronic procurement in public technical,	$H_{01}$ : Technological factors have no significant influence in implementation of electronic procurement in public	P=0.008	Reject null Hypothesis

	vocational and training institutions in Kenya.	technical vocational and training institutions in Kenya.		
2)	To examine the influence of organization factors on implementation of electronic procurement in public technical, vocational and training institutions in Kenya.	H <sub>02</sub> : Organization factors have no significant influence in implementation of electronic procurement in public technical vocational and training institutions in Kenya.	P=0.000	Reject null Hypothesis
3)	To explore the influence of environmental factors on implementation of electronic procurement in public technical, vocational and training institutions in Kenya.	H <sub>03</sub> : Environmental factors have no significant influence in implementation of electronic procurement in public technical vocational and training institutions in Kenya.	P=0.236	Fail to reject null hypothesis
4)	To determine the influence of financial factors on implementation of electronic procurement in public technical, vocational and training institutions in Kenya.	H <sub>04</sub> : Financial Factors have no significant influence in implementation of electronic procurement in public technical vocational and training institutions in Kenya.	P=0.488	Fail to reject null hypothesis

## CONCLUSION

This study concluded that technological factors-which refer to the organization of the existing technologies in use within the organization and new relevant technologies relevant to the organization, have a significant influence in the Implementation of E-Procurement in public technical vocational education and training institutions in Kenya. This result implied that the public technical vocational education and training institutions in Kenya need not to overlook the technological factors in the course of the implementation of e-procurement. Technology applied in an organization can reduce time-to-market and promote social benefits to the organization's stakeholders. Similarly, organizational factors which refer to the organizations scope, size, and amount of slack resources available internally or internal aspect of the organization was also found to have statistically significant influence in the Implementation of E-

Procurement in public technical vocational education and training institutions in Kenya. In view of these results, it is paramount for the public technical vocational education and training institutions in Kenya to be keen on the organizational factors for successful implementation of e-procurement.

However, environmental factors-which were conceptualized as the external environment in which an organization conducts its business including other organizations it interacts with and the relevant standards and regulations, were found not to have a statistically significant influence on the Implementation of E-Procurement in Kenya. These results conclude that a positive attitude on the part of managers toward change creates an organizational environment that is receptive to e-procurement adoption. Top management commitment and support for e-procurement adoption is particularly important during the

implementation stage, when coordination across organizational units and conflict resolution are necessary. On the other hand, financial factors-which pertains to the costs of acquiring the new e-procurement system into the organization, the costs of training of staff, suppliers as well as partners about the new e-procurement system and also the costs of maintaining the new e-procurement system once it has been acquired by the organization, were also established not to have a statistically significant influence on the Implementation of E-Procurement in public technical vocational education and training institutions in Kenya.

## RECOMMENDATIONS

Based on the findings, the study revealed that technological and organizational factors are fundamental factors in the Implementation of E-Procurement in public technical vocational education and training institutions in Kenya. It not only underscores the critical role played by the two factors (technological and organizational) for successful implementation of e-procurement but also in defining the depth and breadth of the implementation. This study therefore recommends that the technological factors and organizational factors including top management support and employee knowledge be an integral decision that the organization need not to overlook. The organization should thus employ every possible means towards allocating resources that are geared

towards limiting both the organizational as well as the technological factors that are likely to be detrimental during the implementation of e-procurement. A positive attitude on the part of managers toward change creates an organizational environment that is receptive to e-procurement adoption. Top management commitment and support for e-procurement adoption is particularly important during the implementation stage.

## Areas for Further Research

The objective of this research was primarily focused on assessing the factors influencing implementation of E-Procurement in public technical vocational education and training institutions in Kenya. However, many public institutions are still having challenges in the implementation of e-procurement despite its inherent benefits. The study could be replicated in a different public sector to establish if similar results can be achieved. On the other hand, this study used a cross sectional survey design. However, cross sectional studies do not detect causal effects of variables. Future research could use a longitudinal study to be able to provide a better understanding whether the used variables influence relationship over time. Similarly, the choice of this study's research variables was guided by Technology Acceptance Model (TAM). Future research can also focus on a range of other factors to evaluate their influence on implementation of e-procurement.

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