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Information Technology and Service Delivery of County Governments in Western Kenya Region

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Abstract

The inappropriateness in use of public monies has been cited as a major distractor towards achievement of development goals enshrined in our constitution. It has been largely attributed to the procurement practices adopted. The main objective of this study was to determine effects of information technology on service delivery of County governments in western Kenya region. The target population for this study entailed 228 officers who were categorized into chief officers, Directors, Finance officers and procurement officers. This study employed stratified random sampling towards picking a sample of 174 respondents. Information technology from the findings of this study had a significant effect on the delivery of services among counties in western Kenya region. Particularly, as Information technology changes by one unit, service delivery changes by 0.309 units units ($\beta 2=0.309$, $P<0.05$). The F value obtained df (1,161) =84.947, $P<0.05$, that gave support to the goodness of fit of the model in adducing variance in the dependent variable. It meant too that Information Technology is a useful predictor of service delivery. This study therefore recommended that County Governments should view and treat information technology as a critical component and resource since its application in procurement activities improves delivery of services.

Keywords: Information Technology, Public Procurement Practices, County Governments, Service delivery

1. Introduction

Information technology has been explained as the usage of computer devices in retrieving, manipulating, processing, storage and transmission of data or information (Englander, 2016). In furtherance, information technology entails a composite of multimedia technologies made up of the internet, software's, hardware's, computers, televisions, telephones, email, satellites, blogs, and internetworking projects (Abou, Abdallah & Muala, 2014). From the previous audits conducted by the office of the Auditor General for the financial year ending 2019/20, there was a revelation of massive misappropriation of public funds which was as a resultant of weak fiscal controls and lack of financial prudence amongst the County Governments. Misnomer such as lack of adherence to Public Procurement laws, Public Finance Management Act of 2012 and mismatches in revenue collected compared to what is remitted to banks were pointed out against County Executives and Assemblies (Kagume & Wamalwa, 2018). Thus it warranted the study to investigate how information technology impacted county service delivery.

For there to be a successful delivery of services in Kenya, it involves public expenditure via sourcing of goods, works and services and thus the integrity of the entire supply chain process from issuing of tenders to actual delivery of supplies displays the prudence in use of public coffers, proper management of resources and adherence to the constitution of Kenya (Kagume & Wamalwa, 2018). However, lack of proper use of public resources has been pointed out in most of the Counties from auditors general report for the past eight years and reportedly 50% of it has been attributed to the procurement practices adopted (Kagume & Wamalwa, 2018). This reports further have persistently disclosed major corruption in the public sector specifically the county governments and as such from this significant reports and media reports majority have been placed on breaches in procurement requirements (Kagume & Wamalwa, 2018).

2. Literature Review

2.1. Innovation Diffusion Theory

The innovation diffusion theory was propagated by Rodger (2018). From the theories assertion is that the choice for adoption of innovation is a mental pathway that entails five steps which include: Knowledge, persuasion, decision, implementation and then confirmation. Information technology as a variable was underpinned by this theory since technology plays a critical role in ensuring a seamless procurement transactions all way from E-tendering to E-payment. This ensures that there is improved service delivery through quickened transactions and more so, there is improved transparency and reduction of cost associated with much paper work and thus the theory was relevant in addressing the information technology aspect adopted as a variable under this study.

Rodgers (2018) explains how and ways in which innovations can be adopted. Rodgers (2018) suggested five traits that ascertain the extent to which innovation may be adopted: the relative advantage that adduces to simple but powerful idea for diffusion of innovation. It is obvious that a persons will tend to embrace new ideas, new products or a new services if they view it to be better than the one in practice. A user will embrace new technology if they establish that the innovation is more useful than the one in operation. And hence the more useful an innovation is, the quicker it diffuses to a social system. The magnitude of the relative advantage is often envisioned through a pot of sub dimensions which comprises of economic profitability, lower startup costs, decline in discomfort, social prestige, saving time, and immediacy of rewards (Francesco, 2013). Diffusion refers to the process via which innovations are disseminated among the people in a social system. He asserts that innovation refers to a concept or an idea, a technical information or an actual practice which is looked at as new by individuals (Rodger, 2018).

2.2. Information Technology

Today, information technology (IT) is globally perceived to be an essential tool towards propagating the performance of the economy of a state. There exist a general agreement that information technology does has a significant effects on the productivity of firms and that the effects could be achieved if information technology is widely dispersed and consumed (Oliveira & Martins, 2017). A study by Mutinga (2013) found out that e-procurement reduces time used in sourcing commodities, decreases costs of admiration and also decreases the tendering price. From a well-structured policy of ICT, a firm can ensure that social and political activities, data security management, privacy procurement and management of inventory in conjunction with technical and operations of the organization are efficiently and effectively managed (Radonji & Reuben, 2019).

Nyonje and Wairiuko (2018) asserted that government of Kenya has to establish an ICT policy in specific for the county governments in order to make sure that drawbacks such as inadequacy in infrastructure, low network together with power blackouts are indeed taken care of. The findings by Karungani (2017) asserted that ICT infrastructure has a major stake in uplifting of performance in organizations with respect to procurement operations and processes and that ICT infrastructure boosts efficiency, streamlines communication, hikes monitoring and control and enhances delivery of services. According to Oyelaran and Barclay (2014) the low density on ICT adoption has been attributed to technology use impediments such as lack of ICT infrastructure and cost implications.

Giri and Shakya's (2018) focused on developing information and communication technologies and Delivery of Services Mechanisms in Nepal's public sector. The study looked at quantitative research methods and employed survey study to collect firsthand information from workers of government agencies. According to the study, equipping service providers for new information and communication technologies tools, and systems required ongoing programs for their capacity building. Additionally, it discovered that collaboration, linking, and connectivity among government agencies can increase the efficiency of the use of information and communication technologies for public service delivery among agencies, divisions, and business entities. In contrast to the previous study, which employed a design based on surveys, the current study used explanatory approaches. Additionally, the research did not specify how the size of the sample for participants was calculated.

Bagheri et al. (2012) research investigating the association amongst IT investments, company success, innovation, and firm growth selected the top Iranian manufacturers as its case study. According to the report, IT increases a company's ability for invention. The main driver of increases in a company's operational and financial success is typically innovation. A survey design was employed in this investigation. The results also demonstrated that the company's growth significantly reduced the impact of IT on inventiveness. Finally, the results demonstrate that technological advancement affects business success. The study was nonetheless conducted in the manufacturing sector. Firm expansion was previously used as a moderating variable, in contrast to the current study where rules governing public procurement will be used as a moderator.

Slim et al. (2020) published their findings on the effect of information technology organizational aspects on the performance of SMEs in Iraq. An online survey was employed for the inquiry. The results of the research demonstrated a positive and significant relationship between small business success and the usage of information technology. The current study, however, utilized an explanatory research design, whereas the prior study utilized a survey design.

Oladejo and Adereti (2010) examined how information technology affected the effectiveness of microfinance organizations in Nigeria's Ogun State. The research used a survey methodology. In Nigeria, there are 427 MFBs registered, therefore 4 were chosen as a representative group. The study found that significant investments in information technology was responsible for the recent rise in effectiveness as well as effectiveness among Nigeria's micro banking industry. The number of participants that was chosen was too small to allow for the study's findings to be extrapolated. The present research concentrated on the county governments in Kenya, whereas the previous study concentrated on microfinance banks.

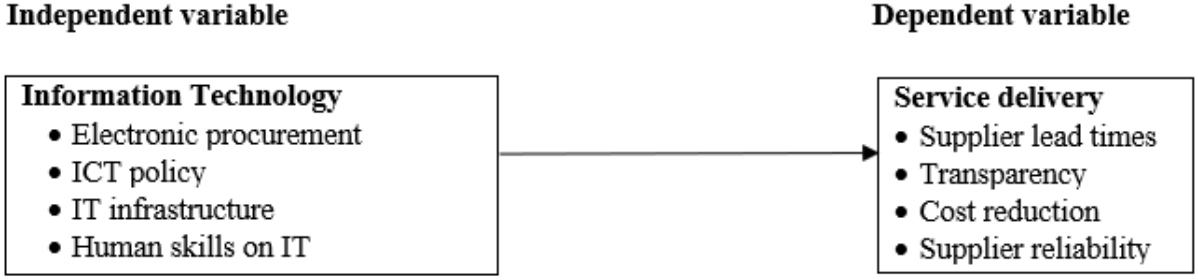
At the Tafo Government the hospital in Ghana, Addo and Agyepong (2020) conducted a research investigation on the impact of ICT (information and communication technology) on the provision of healthcare services. Knowledge and attitudes of workers as well as the successful and effective utilization of ICT were independent variables that the study examined. We employed a survey with a descriptive design. Data were gathered using a questionnaire with semi-structured questions that was given to 50 respondents using a stratified random sample procedure. Information and communication technology (ICT) applications were proven to speed up medical diagnosis, lessen user work load, decrease patient wait times, and enhance information accessibility. It was further proven that ICT enhances support for clinical decisions and collaboration, improving the incorporation of the clinical processes amongst nursing along with other healthcare providers. Aside from that, the results above It has been confirmed that integrating information and communication technology (ICT) assets into the provision of health services is essentially difficult without enough power, infrastructure for information and communication technologies, technical know-how, and skills. The current study will be done inside the County Governments, as opposed to the health care industry, where the previous investigation was undertaken. The study was conducted on a singular entity in the republic of Ghana while the current study will expand the scope to four County Governments in the republic of Kenya.

In a paper titled The Effects of Information and Communication Technologies on the Productivity of Ethiopian Private Banks: The Case of Two Selected Ethiopian Private Banks, (Nigussie, 2015). Using a case study methodology, it was determined through the results of the research that the use of IT does, in fact, have a positive and significant impact on how well Ethiopian private banks function in terms of pleasing their customers and enhancing the performance of their personnel. The research used a case study, so its conclusions might not apply to other public bodies.

In a research titled "The impact of ICT Deployment on Small and Medium-Sized Businesses in Rwanda: A Case Study of Kigali City," (Mukamanzi &Ndikubwimana, 2018). Expected advantages, ICT expertise and skills, and government support were used to gauge ICT adoption. A cross-sectional methodology was used in the study. Through the distribution of surveys, information was gathered. The statistical program SPSS was used for entry of data and interpretation. ICT adoption was found to be significantly influenced by perceived benefits, ICT knowledge and abilities, and government backing. This was consistent with Addo and Agyepong (2020) earlier research, however, there was no theoretical foundation for the study, and it also looked at a direct correlation among the variables.

As per Mukamanzi and Ndikubwimana (2018) in a concentrate on the impacts of ICT reception on little and Medium measured ventures in Rwanda: A Contextual investigation of Kigali City. Reception of ICT was estimated as seen benefits, ICT information and abilities and government support. The review took on a cross-sectional exploration configuration approach. Information was gathered through the organization of polls. The utilization of SPSS programming performed information passage and investigation. Discoveries laid out that apparent advantages, ICT information and abilities and government support were critical components of ICT reception. This was in concurrence with the past concentrate by (Addo & Agyepong, 2020). The review was anyway not secured on any hypothetical foundation and besides thought to be an immediate connection between the factors under study.

2.3. Conceptual framework



Source: Researcher's conceptualization (2023)

3. Materials and Methods

3.1. Materials

The main objective of the study was to examine the effects of Information Technology on service delivery of County Governments in Western Kenya Region. The hypothesis of the study stated that, **H01** is Adoption of information technology has no statistical significant effect on service delivery of County Governments in Western Kenya Region.

3.2. Methods

The explanatory research design was adopted for this study which explores that cause effect relationship. This design antecedes that there shall be a systematic collection of data in a standardized manner from a known population or representative (Mugenda & Mugenda, 2015). The scope of the study entailed the County Governments in Western Kenya Region that include Bungoma, Busia Kakamega and Vihiga. The target population entailed 228 officers drawn from Chief Officers, Directors, Finance officers and Procurement officers. Stratified random sampling was explored in drawing a sample of 174 respondents working in these Counties. The study collected quantitative data by means of self-administered questionnaire while qualitative data was collected through the use interviews and open ended questions. Quantitative methods of data analysis was employed with both descriptive and inferential statistics (frequency, Percentages, means and standard deviations) being applied to explain each objective of the study. The regression equation used to represent the relationship between information technology and service delivery was in the form of:

$$P=\beta_0 + \beta_2 X_2 + \varepsilon$$

Where;

In this case, P is denotes service delivery, β_0 denotes the intercept (a constant), β_2, denotes the slope which is associated to independent variable X_2 (Information Technology) and ε denotes the error term that is assumed to be independent, identical, normally distributed random variable, with a zero mean and a constant variation.

4. Results and Discussion

4.1 Overall Reliability

The acquired internal coherence values of the relevant items and related constructs were used to assess the degree of reliance of each individual item. Each construct's internal coherence was evaluated using Cronbach's Alpha internal consistency measure. The validity of each construct rating was investigated. Cronbach's alpha is 0.798, which is higher than the required 0.7, as stated in Table 1 The Cronbach's alpha value for second-order variables varied from 0.784 to 0.842. As shown in Table 1 below, all study variables satisfied the essential reliability requirement and were retained for further analysis because they did not lose scale items.

Table 1. Overall Reliability of Research Instrument

Construct	Cronbach's Alpha	No of items	Decision
Strategic Procurement Planning	0.787	8	reliable
Information Technology	0.749	8	reliable
Green Procurement	0.842	8	reliable
Public Procurement Act and Regulations	0.829	15	reliable
Service Delivery	0.784	8	reliable
Overall	0.798	47	reliable

Source: Survey Data (2023)

Information Technology is one of the determinants of service delivery in County Governments in Western Kenya Region. A series of eight questions were asked to measure information Technology. The participants were asked to respond the extent to which they agreed or disagreed with the statements. The pertinent results were captured in Table 2 below:

Table 2. Descriptive Statistics for Information Technology Practice and Service Delivery

Information Technology	**Response**					**Skewness**		**Kurtosis**	
	N	**Minimum**	**Maximum**	**Mean**	**Std. Dev**	**Statistic**	**Std. Error**	**Statistic**	**Std. Error**
Specifications for procured items are posted to county website.	161	1	5	4.49	.662	-1.452	.191	3.732	.379
Calls for tender proposal are done on county electronic procurement platform.	161	1	5	4.36	.666	-1.210	.191	3.486	.379
The county has put in place clear guidelines on the use of ICT for its transactions.	161	2	5	4.01	.874	-.295	.191	1.027	.379
Technological resources have led to overall good performance of the County.	161	2	5	4.02	.922	-.518	.191	.726	.379
E-payments has been achieved due to proper implementation of e-Procurement.	161	2	5	4.02	.916	-.627	.191	.447	.379
Members of staff are equipped with ICT skills and knowledge required to implement electronic procurement.	161	1	5	3.83	.986	-.407	.191	.700	.379
Training of staff on the use of e-Procurement tools enhances the implementation of e-procurement.	161	2	5	4.48	.766	-1.659	.191	2.642	.379
Electronic Procurement manual within the organization to guide on e-Procurement processes boosts its implementation.	161	1	5	4.42	.737	-1.321	.191	2.269	.379
AVERAGE	**161**	**2.625**	**5**	**4.204**	**.505**	**-.573**	**.191**	**.295**	**.379**

Source: Survey Data (2023)

Information technology statements were summarized into a likert scale and their means and standard deviations established as displayed in Table 1. The respondents agreed that Specifications for procured items are posted to county website (M=4.49, SD=0.662). The insignificant deviation hinted that all the counties did not post specifications of items to be procured to the county website. In addition, the respondents agreed that calls for tender proposal are done on county electronic procurement platform (M=4.36, SD=0.666). The insignificant deviation hinted that all the counties did not place calls for tender proposal on county electronic procurement platform. Further, the respondents agreed that the county has put in place clear guidelines on the use of ICT for its transactions (M=4.01, SD=0.874). The insignificant deviation hinted that all the counties had not placed clear guidelines on the use of ICT for its transactions.

This agrees with the studies of Radonji and Reuben (2019) who established that a well-structured ICT policy within an organization guarantees social and political activities, data management security, privacy procurement and inventory management together with technical and operations of the organization are efficiently and effectively managed. The respondents also agreed that technological resources have led to overall good performance of the County. (M=4.02, SD=0.922). The insignificant deviation hinted that technological resources have not led to overall good performance of the County. As shown in the results, the respondents agreed that the E-payments has been achieved due to proper implementation of E-Procurement (M=4.02, SD=0.916). The insignificant deviation hinted that E-payments have not been achieved due to poor implementation of E-Procurement. Further, the respondents agreed that Members of staff are equipped with ICT skills and knowledge required to implement electronic procurement (M=3.83, SD=0. 986). The insignificant deviation hinted that not all members of staff in the counties are equipped with ICT skills and knowledge required to implement electronic procurement. The respondents also agreed that Training of staff on the use of E-Procurement tools enhances implementation of E-procurement (M=4.48, SD=0.766). The insignificant deviation hinted that Training of staff on the use of E-Procurement tools does not lead to enhanced implementation of e-procurement. The respondents also agreed that Electronic Procurement manual within the organization to guide on E-Procurement processes boosts its implementation. (M=4.42, SD=0.737). The insignificant deviation hinted that procurement manuals within the counties does not boost its implementation.

For effect of Information Technology practice on Service Delivery of County Governments in Western Kenya the responses were spread between the range of $3.83 \leq \mu \leq 4.49$ at S.D=.505 with a mean response of 4.204. Pertaining to Skewness and Kurtosis values, either are less than ± 1.0 pointing to the fact that the distribution was not outside the range of normality and such the distribution is considered normal. The measure for Skewness is in the manner that if its values are less than -1.0 then the distribution is left skewed and when the Kurtosis values are greater than +1.0 then the distribution is Leptokurtic as depicted in the outcome above. The vast majority of those surveyed who were asked about the advantages of using IT in purchasing stated that it boosts openness, which reduces theft, mistakes, and the expenses related to traditional procedures, as well as speeds up the completion of purchasing transactions. Some of the respondents also mentioned how technology makes it easier to create an audit trail, which ensures an openness of purchasing operations. Regarding the significant changes in technology, respondents also discussed how their Counties made sure that they were familiar with their abilities and expertise in IT.

4.2 Correlation between Information Technology and Service delivery

Pearson Correlation was conducted to establish the association between Information Technology and delivery of services among county governments in western Kenya region. In examining the effect of Information Technology on service delivery the study found out a correlation coefficient (r) of 0.589^{**} ($p<0.05$) at 95 % confidence level. This postulates that there is a moderate and positive relationship between Information Technology and delivery of services of County governments in western Kenya region. This implies that an increase in information technology will lead to increase in delivery of services among county governments in western Kenya region. The results shown in Table 3 below:

Table 3. Correlation between Strategic Procurement Planning and Service delivery

		SPP	SERV Del
IT	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	162	
SERV Del	Pearson Correlation	.589**	1
	Sig. (2-tailed)	.000	
	N	162	162

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

*. Correlation is significant at the 0.05 level (2-tailed).

4.3 Regression results of Information Technology and Service Delivery

According to Hypothesis which stated, information technology has no significant statistical impact on how county governments in Western Kenya deliver services. With the model shown in equation 1 below, the impact of information technology on county government service delivery in western Kenya was assessed using linear regression analysis:

$$P = \beta_0 + \beta_2 X_2 + \varepsilon_2 \quad (1)$$

Where P stands for "Service Delivery," whereas "β0" is the intercept (a constant), "β2" is the slope related to the independent variable "X2" (Information Technology), and "ε" is the error term, that is presumed to be an independent, identical normally distributed random variable with a mean of 0 and a variance that is constant.

Regression analysis was conducted to establish the rate of proportion in the dependent variable (service delivery) which can be explained by the independent variable (Information Technology). Table 4 shows the analysis of the results.

Table 4. Model Summary of Information Technology

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.589[a]	.347	.343	.41980

a. Predictors: (Constant), IT

Source: Field Data (2023)

The R^2 for the regression model between Information Technology and service delivery was 0.347 implying that Information Technology explains 34.7% of variation in service delivery of County Governments in western Kenya Region while the remaining variation is explained by the error term.

Table 5. ANOVA of Information Technology and Service Delivery

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.970	1	14.970	84.947	.000[b]
	Residual	28.197	160	.176		
	Total	43.168	161			

a. Dependent Variable: SERV Del

b. Predictors: (Constant), IT

Source: Field Data (2023)

From the F test value df (1, 161) =84.947, P<0.05, this gave support to the goodness of fit of the model towards explaining variation in the dependent variable. It means also that information technology is a useful predictor of service delivery.

Table 6. Coefficients for Information Technology and Service Delivery

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.706	.243		7.018	.000
	IT	.571	.062	.589	9.217	.000

a. Dependent Variable: SERV Del

Source: Field Data (2023)

The regression model obtained from the output was

Service Delivery=1.706 + 0.589 Information Technology + error

The standardized regression coefficient for Information Technology was 0.589.This indicated that a unit increase in Information Technology would result in 58.9% increase in service delivery of County Governments in Western Kenya Region.At the 5% significance level, the t-statistic for the regression coefficient for Information Technology was significant (T=9.217, p<0.05), suggesting rejection of the null hypothesis. The research findings suggests that there exists a substantial positive association between information technology and delivery of services among county governments in western Kenya region on the basis of these figures.The null hypothesis which indicated no existence of a significant statistical effect of information technology on delivery of services among county governments in western Kenya was therefore rejected and the alternative hypothesis which indicated existence of a statistically significant effect of information technology on delivery of services among county governments in western Kenya was instead accepted.

The study findings concurs with the innovation diffusion theory by Rodger (2018) which established that individuals within firms adopt innovativeness and new technologies with regards to the relative advantage that the technology brings. Therefore information technology could be an enabler in improving organizations performance especially when technology happens to be simpler as there will be a higher rate of adoption. Also, the extent of relative advantage that comes with the adoption of technology in procurement is often displayed by a pot of sub dimensions that entails economic profitability, lower initial costs, decreases in discomfort, social prestige, saving time, and immediacy of rewards (Francesco, 2013). Therefore, for the purpose to accomplish the desired benefits, the County Governments ought to make an attempt to ensure the necessary infrastructure for IT has been put in existence as well as that staff is taught about how to implement the application of IT in procuring. As a result, using ICT for the provision of services to the public could be more effective via integrating, collaboration and compatibility among governmental departments and organizations through ongoing training initiatives. These findings also demonstrate a positive significant relationship between IT and County Governments' capacity for offering services to western Kenya. Electronic buying has the possibility of helping reduce expenses related to purchasing, reduce time, help streamline the process of tendering, and enable vendors all over the globe to compete for a buyer's business, thus increasing organizational effectiveness (Smart & Harrison, 2003).The findings of this study support the findings from Mutinga (2013), who came to the same conclusion that employing IT to assist operations like electronic purchasing reduces time spent looking for items, administrative expenses, and tender prices. The following observation was provided by an interviewee in agreement with the research's findings:

"By incorporating technology in procurement, it helps to achieve transparency, fast transactions, and reduction of costs that are usually associated with paper work, bureaucratic procedures and more so it facilitates audit trail. I thefore appreciate the contribution that technology has played in facilitating procurement transactions to ensure value for money."

Study by Anandarajan (2013) demonstrates that a range of individuals with ICT skills are in higher demand as a result of ongoing technological development and significant financial investment. This is consistent with the innovation diffusion theory, which contends that the compared advantages of innovation to the options presently in use will determine how quickly it spreads. The findings of Chemutai and Chebet's (2019) are also comparable in that they discovered how the implementation of IT affects how successfully government entities provide services. This was supported by study of Slim et al. (2020), which discovered a significant and positive correlation between the adoption of IT and the efficiency of small micro Enterprises. Rehman, Nor, Taha, and Mahmood's (2018) examination demonstrated that IT within Malaysia had little influence on corporate performance, however their study's conclusions frequently vary from this study findings. Information technology (IT) is a vital tool for enhancing the financial condition of Counties' service delivery, and its application in the purchasing process improves the delivery of services, according to the research's findings.

5. Conclusion

Pertaining Information Technology, the established that information technology is fairly available to the county governments of western Kenya region. The county government staff need to have the necessary skills which can be enabled through training and capacity building programmes. This will improve on transparency, reduction of cost and faster transactions brought about by the application of technology in procurement activities. The challenge being inadequate finances to procure enough technological resources, low network experienced by the IFMIS, are areas that could be improved to realize the intended benefits of information technology. It was therefore concluded that information technology has a significant relationship with service delivery levels in county governments of western Kenya region.

The study recommended that County Governments should treat information technology as a critical resource as its application in procurement activities improves delivery of services and contributes immensely in ensuring that there is transparency, speedy transactions, facilitate easy audit trail, reduces human interference and reduction of costs associated with paper work.

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