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INFLUENCE OF TECHNOLOGY USE ON PROCUREMENT PERFORMANCE IN NZOIA SUGAR COMPANY LIMITED, BUNGOMA COUNTY; KENYA

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ABSTRACT

Organizations have realized the importance of procurement performance with an essence of establishing and maintaining their competitive advantage. Manufacturing sector being prone to heavy purchases of materials and sales of finished goods in any economy values the relevancy of Supply Chain Operations in the production system. Procurement performance is regarded as the efficiency and effectiveness of procurement processes in an organization. Supply Chain Operations are considered as very important on the aspect of organization's competitive advantage which at the end yields to effective organization performance. The integration of Supply Chain Operations and procurement functions might give rise and result into competitive performances; hence arising of this study. The specific objective was; to determine the effect of Technology Use on Procurement Performance of Nzoia Sugar Company Limited, County Government of Bungoma; Kenya. This research problem employed descriptive research design. The target population of this study composed of employees of Nzoia Sugar Company Limited who were directly associated to decision making on procurement matters in the factory. Census technique was applied on the population and the entire targeted population was examined since it was manageable. The study used structured questionnaire as an instrument of primary data collection. Both descriptive and inferential statistics were focused on and the computation was done by use of SPSS version 24 to test the primary data that was collected to satisfy the objectives of study. Pilot study was conducted in Butali Sugar Company Limited to find out the validity and reliability of analysis of data for the study. Further, a structural regression equation model was developed to test the relationships between the variables by use of the SPSS version 24 software analysis and conclusion generated was done with respect to the objectives of the study; Technology Use practices had significant effect on Procurement Performance of Nzoia Sugar Company Limited, County Government of Bungoma; Kenya. This study recommended for further study in other organizations especially service industry using similar variables and different method.

***Key words**; Technology Use, Procurement Performance*

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INTRODUCTION

Current competitive business, there is an increased focus on delivering value to the customer. Hence there is focus on attention of most of businesses is providing products and services that are more valuable compared to its competitors. Concurrent to the focus on customer value, the marketplace in which businesses operate today is widely recognized as being complex and turbulent (Christopher, 2000; Goldman *et al.*, 1995). The growth of supply chain aims to improve profitability, customer response and ability to deliver value to the customers and also to improve the interconnection and interdependence among firms. Due to market expanding from domestic market to global market increase customer demands, for instance demanding lower prices, faster delivery, higher quality products or services and increase the variety of items (Braunscheidel, 2005). According to Towil and Christopher, (cited in Thatte, 2007), the end customer in the marketplace today determined by the success of failure of supply chains management practices. They stated that getting the right product, at the right price, at the right time to the customer is not only improved competitive success but also the key to survival.

On the global and local scene, institutional organizations embrace procurement functions as very important for the success and development in assets and wealth maximization of the owners. In the study by Giunipero *et al*., (2006) on supply chain management, Procurement include; acquisition of goods, services, capabilities and knowledge required by businesses, from the right source, the right quality, in the right quantity, at the right price and at the right time to maintain and manage a company's primary and support activities. Scholars among them, Porter 1998 and Triantafillou (2007) postulated procurement as a spine of business functions. In the study by Mangan *et al.,* (2008) on supply chain management, procurement is a process of identifying and obtaining goods and services. According to Sollish and Semanik (2012), procurement included sourcing, purchasing and could cover all activities from Procurement practices, hence are a set of activities undertaken by an organization to promote effective management of its supply chain. As concerns private firms, Walter *et al*., (2015) contemplated procurement being the foundation for private firm's success. Its proper practices lead to competitive purchase and getting quality materials and services

In the study by Kim *et al.,* (2013) on supply chain management, main goals of procurement are related with quality, financial and technical risks reduction, creating integrity in the organization and safeguarding from competition; hence Procurement is vital to organizations and its strategies have become part of a business success. It boosts efficiency and competitiveness and to realize these, it is vital to give emphasis about the strategic factors that affect the performance of the procurement function. Internal and external forces are influencing the ability to recognize the procurement goal. Scholars' study on supply chain, among them Porter (1998) embraced relations among different elements like professionalism, staffing levels and budget resources, organizational structure whether centralized or decentralized, procurement regulations, rules, guidelines, and internal control policies, all have impact on the performance of the procurement function and needs consideration.

According to Migai (2010) study on supply chain management, private sector is characterized by poor procurement performance, hence it is the problem for its growth and it becomes the cause for delay in delivery, increase defects, and delivery of low quality goods or no delivery at all. In the private sector poor procurement performance has been a problem because of traditional procurement procedures, incompetent staff, poor coordination of procurement activities, failure to embrace e-procurement, absence of quality assurance policies and proper regulations. Juma (2010) expressed and contemplated activities of procurement usually suffering from neglect, poor co-ordination, lack of open competition and transparency.

Accordingly Procurement performance is a measure of identifying the extent to which the procurement function is able to reach the objectives and goals with minimum costs (Van -Weele, 2002). Accomplishment of a given procurement task is measured against pre-set known standards such as; cost ,flexibility ,accuracy, completeness, speed, quality of supplies, and supplier profile among many others. Procurement performance is regarded to be the fulfilment of an obligation, in a manner that releases the performer from all liabilities under the contract. For any organization to change its focus and become more viable, Amaratunga and Baldry (2014) suggested that procurement performance is a key driver to improving Superiority of services while its absence or use of inappropriate means can act as an obstruction to change and may lead to decline of the purchasing function. On the surface, effectively measuring procurement performance may appear simple however looking deeper, adequate measurement of procurement success is a big issue.

In supply chain management, supplier relationship activities play an important role (Wisner, 2003). Accordingly long-term relationships refer to intention that the arrangement is not going to be temporary (Chen & Paulraj, 2004). Through close relationship supply chain partners are willing to share risks and reward, and maintain the relationship on long term basis (Landeros & Monczka, 1989; Cooper & Ellram, 1993; Stuart, 1993; Thatte, 2007). Toni and Nassimbeni (1999) identified that a long-term perspective between the buyer and supplier increase the intensity of firm-supplier integration relationship. Firms that integrate with customers including: planning, implementing, and evaluating a successful relationship between the provider and recipient of both upstream and downstream of the supply chain. Therefore, customer relationship management (CRM) is not only focused on inbound customer relationships but also on outbound customer relationships in SCM. Customer relations related to the company's ability to communicate to the delivery of appropriate products and services to customers locally and globally in the right time, right place, and appropriate of quantity and quality. Customer linkage especially sharing product information with customers, receiving customer orders, interact with customers to manage demand, after placing the order system, share the status of orders with customers on scheduling orders, and product delivery stage (Lee, *et al*, 2007).

Statement of the Problem

In the study by Bowersox and Closs (1996) on procurement, the scholars showed that to be fully effective in current's competitive business, companies must develop their integrated behavior to incorporated customers and suppliers. However, many articles have been published in various disciplines to try to define the supply chain management and discuss future directions and the corresponding empirical research methodology (Cooper, *et al.,* 1997; Lambert & Cooper, 2000; Larson & Rogers, 1998; Tage, 1999). According to Lummus and Vokurka (1999), supply chain management includes all activities involved in delivering products from raw material to customer, including sources of raw material and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and order management, distribution across all channels, delivery to customers and information systems required to monitor all activity.

In the study by Magutu, Njihia and Mose (2013) on procurement, procurement performance has been attracting great attention from practitioners, academicians and researchers due to poor performance resulting from non-adherence to proper processes and procedures. According to Nyeko (2004), an obvious performance measure of the success of any purchasing department is the amount of money saved by the company. Procurement department, like all other departments in a company, is an element of the overall organization, which must contribute to the achievement of the corporate goals. The procurement performance of distribution logistics

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impacts tremendously on the performance of logistics companies (Paulraj & Chen, 2007). This is mainly because it links the organization to the customers and thereby has much influence on customer satisfaction which influences customer loyalty, arguably the single most important asset of an organization. However, despite distribution logistics being very vital, many logistics firms perform short of customer expectations in this area. Most of the scholars among them Otieno (2014) researched on supply chain operations affecting procurement performance but these scholars never zeroed on affiliation of Technology Use; hence the study of effect of Technology Use on Procurement Performance in Nzoia Sugar Company Limited, County Government of Bungoma; Kenya.

Specific objectives

The study determined the effect of Technology Use on Procurement Performance of Nzoia Sugar Company Limited. The research was guided by the following hypothesis;

- H_0 Technological Use has no significant effect on Procurement Performance of Nzoia Sugar Company Limited

LITERATURE REVIEW

Just In Time (JIT) Model

JIT is a Japanese management philosophy which has been applied in practice since the early 1970s in many Japanese manufacturing organizations. It was first developed and perfected within the Toyota manufacturing plants by Taiichi Ohno as a means of meeting consumer demands with minimum delays. Taiichi Ohno is frequently referred to as the father of JIT. Toyota was able to meet the increasing challenges for survival through an approach that focused on people, plants and systems. Toyota realized that JIT would only be successful if every individual within the organization was involved and committed to it, if the plant and processes were arranged for maximum output and efficiency, and if quality and production programs were scheduled to meet demands exactly (Yin, 2014) JIT manufacturing has the capacity, when properly adapted to the organization, to strengthen the organization's competitiveness in the marketplace substantially by reducing wastes and improving product quality and efficiency of production. When first developed in Japan in the 1970s, the idea of just in-time (JIT) marked a radical new approach to the manufacturing process. It cut waste by supplying parts only as and when the process required them. The old system became known (by contrast) as just in- case; inventory was held for every possible eventuality, just in case it came about. This is an inventory management systems method whose goal is to maintain just enough material in just the right place at just the right time to make first the right amount of the product (Lewin, 2012).

Japanese manufacturing firms where inventory is acquired only when required in business for production process and this aimed at improving the return on investment of the business by reducing in-process inventory and its associated costs (Leonard, 2000). In this system, the supplier has the responsibility of delivering the components and part to the production line "Just in Time" to be assembled. Other names for just in time system is Zero stock inventory and production. For the just in time method to work successfully the quality of the parts must be very high because defective materials could up halt the operations of the assembly line, there must be dependable relationships and smooth co-operation with suppliers, ideally this implies that the supplier should be located near to the company with dependable transportation available (Hendrick & Signhal, 2005). Just in time inventory management systems system helps in reducing inventory costs by avoiding carriages of excess inventories and mishandling of raw materials. According to Lewin (2012), Just in purchasing recognizes high costs associated with holding high inventory level and as such it has become important in most organizations to order inventory just in time for production so as to cut costs of holding inventory like storage, lighting, heating, security, insurance and staffing.

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Transaction Cost Economies Theory

Transaction Cost Economics is an economic theory that provides an analytical framework for investigating the governance structure of contractual relations within a supply chain. Transaction Cost Economics theory inspects how business partners who collaborate with each other shields one another from harmful subsidiary with differing relationships (Klein, 2000). It has been the most important new institutional theory which puts the accentuation on the decision on the sourcing predicament, if to outsource or not. The sourcing situation of a firm is likewise described as the make-or-buy decision of a firm (Christopher & Shook, 2009). The two primary drivers of Transaction Cost Economics are uncertainty caused by the external environment and costs, which consist of Coordination costs and Transaction costs, uncertainty and costs, are influenced by the human agent, an individual distinguished through bounded rationality and opportunism, in order to dissect transaction costs (Fink, 2006).

A publication by Williamson (2008) points the need for further elaboration of the link between Transactions Costs Economics theory and supply management, where Transaction Cost Economics examines individual transactions, while supply management introduces a broader systems perspective in which groups of related transactions are managed as chains. Transaction Cost theory might be one of the most important organization theories because of the studies that have been encouraged trough it (Williamson 2010), and is one of the main perspectives in organizational studies (David & Han 2004). The vital commitment of Transaction cost economics to organization theory, resulted in a wide range of empirical contributions, using transaction cost economics, for instance as a make or buy decision help, or verification of the right contract mode (Macher & Richman 2008).

Transaction cost theory tries to reveal why many firms are in existence, and why firms expand or source out deeds to the firms in external environs. The transaction cost theory assumes that majority of firms attempt to reduce the costs of exchanging resources within the environment and that these firms try to curb the bureaucratic costs of exchanges within the company. The majority of these firms are as a result weighing the costs of switching resources with the environs, against the bureaucratic costs of performing activities in-house. Lysons and Farrington (2006) further clarify that, the theory refers to the idea of the cost of providing for goods or services if it was purchased in the marketplace rather than from within the firm and elaborate the three concepts that underpin the theory for example transaction costs, asset specificity and asymmetrical information distribution. Transaction costs are comprised of search and bargain costs; bargaining and decision costs; and policing and enforcement costs. Asset specificity refers to the relative lack of transferability of assets for example sites, physical assets, human assets, brand names, dedicated assets, etc., intended for use in a given transaction to other uses.

In procurement activities, the main activities of Transaction cost economics are centered within 5 processes, namely category strategy, supplier strategy, quotation supplier selection and negotiation, operative procurement and supplier evaluation. Within the first process, the category strategy, the buyer puts equal products into one pool and can then determine a strategy for this pooled group (Schiele, 2011). A strategy could vary from single vs. multiple sourcing, or international vs. national sourcing.

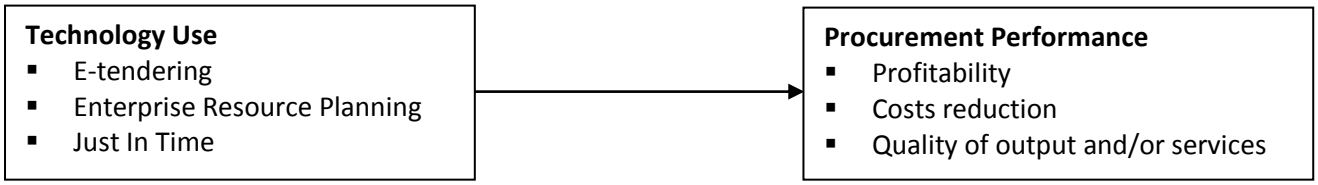
Williamson (2010) argued that the company should make a component if transaction costs cannot be kept low, use a hybrid governance approach if asset specificity is high but transaction costs can be kept low through the safeguards provided in the contract, and use the market if the component which has to be supplied has low asset specificity. Coming to the sourcing strategy, whether to use multiple suppliers or a single supplier, one might use the same approach of the human agent as being opportunistic and limitedly rational, as in the

make or buy decision. Single sourcing is used when the supplier offers special technology, which can lead to a competitive advantage of the company; however the relationship has to be safeguarded to ensure a cooperative relationship.

Diffusion Innovation Theory

This theory would guide the study investigate the relationship between ICT Integration and procurement performance in logistic companies in Nairobi, Kenya The Diffusion of Innovation Theory was developed by E.M Rogers in 1962 and was established to explain how over time, an idea or product gains momentum and spreads through various social systems. The end result is that people, as part of a social system either adopt or reject a new innovation, behavior or product. The key to adoption is that a person must perceive an idea, behavior or product as new or innovative; it must add some kind of value to that person's life. A substantial literature exists that investigates Inter-organizational information systems (IOS), and IT adoption, diffusion and use. The assimilation of e-Procurement initiative can be an issue of technology diffusion and adoption of innovation. Obviously, innovation diffusion theory can be used to understand e-Procurement assimilation as the theory has also been extensively used recently as a fundamental theoretical base of innovation adoption research in the field of IS/IOS (Palmer & Butt, 2008).

As the adoption of e-Procurement as an innovation generates uncertainty, the procurement organization must be aware of the relative advantage and risk of implementing such innovation. Although the attributes suggested by IDT include relative advantage, compatibility, complexity, trial ability, and observability, only two variables relative advantage and compatibility (of an innovation with existing practices and values) have been consistently found to be positively related and only variable complexity (that is degree to which an innovation is perceived as relatively difficult to understand and use) has been consistently found to be negatively related to adoption of innovation (Cummings & Qiao, 2013). As the different public sector agencies with different adoption intensity can perceive the characteristics of an innovation differently, Angel, (2012) suggest taking perception-based characteristics of innovation into account rather than the inherent characteristics of the technology that do not vary across settings and organizations. This theory led to the fourth research question: What is the influence of ICT integration on procurement performance among logistics companies in Nairobi, Kenya?



Independent Variables **Dependent Variable**

Figure 1: Conceptual Framework

Source: Author

METHODOLOGY

This study used descriptive survey design which involved collecting data of the answered questions about the respondents of the study. Target population consisted of Nzoia Sugar Company Limited employees who were directly linked to procurement and supply chain operations. They were officers in the departments of finance, procurement, warehousing, audit and ICT. Since the target population was 69 respondents, all the target population was subjected to the entire study process. Census technique was applied since the population was manageable. The researcher used close ended (structured) questionnaires to collect

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primary data from Nzoia Sugar Company Limited officers who were directly linked to the transaction to do with purchasing and disposals of goods. Data was collected by self-administered questionnaire. The quantitative data collected was analyzed by Statistical Package for Social Sciences (SPSS 24) where descriptive statistics was computed to help in describing and interpreting data in line with study objectives. For variable relationships, correlation and regression analysis was also examined. Analyzed data was presented by use of tables and in prose form. The Analytical model for the study took form of: $Y = \alpha + \beta_1 X_1 + \varepsilon$

Where;

Y= Procurement Performance

α= Constant Term

β= Beta Coefficient –This measures how many standard deviations a dependent variable was change, per standard deviation increase in the independent variable.

X_1= Technology Use.

ę = Error term

FINDINGS AND DISCUSSIONS

In this study, a total of 69 questionnaires were administered out of which only 62 questionnaires were returned, hence represented a response rate of 90%. According to Mugenda and Mugenda (2003), response rate of 50% is good enough for analysis even though researchers should aim as high response rates as possible. More so, Babbie (2014) also asserted that a return rate of 50% is acceptable to analyze and publish, 60% is good and 70% is very good. Based on these assertions, 90% is greater than 50% and 70% and therefore was concluded to be enough to draw conclusion.

Descriptive Statistics: Technology Use on Procurement Performance

The study objective sought to determine the effect of Technology Use Practices on Procurement Performance in Nzoia Sugar Company Limited. Table 1 showed the statistical results in details.

Table 1: Descriptive Statistics for Technology Use practices

Team Work	Mean	Std. Dev
Management of the company encourages every employee to be computer literate	4.11	.946
ERP software associated machines have been installed in all departments	4.24	.771
There exist some informal groups resistance to technological change	3.82	1.130
Workshops are held by the company frequently on technological use	3.94	.992
Most employees are satisfied with the technological changes. For example E-Tendering	3.63	1.063
Processes involved under technology follow ISO certification Norms.	4.13	.911
Overall mean	**4.11**	

From table 1, the findings established that the participants strongly agreed (mean = 4.11; Std. dev = .946) that management of the company encourages every employee o be computer literate; hence Technology Use is instrumental for procurement performance. The statistics showed that the ERP machines had been installed which enables procurement performance be integrated in all departments. The findings also concurred with a mean of 4.24 and Standard deviation of 0.772 that ERP improves Procurement Performance. However, with regards to the question on informal group resistance, respondents supported for improvement of procurement performance, hence reflecting a mean of 3.82 and standard deviation of 1.130. However, most respondents remained neutral at 24.1%. The study revealed that while a significant majority of the respondents agreed with a mean of 3.94 and Standard deviation of 0.992 that workshops are held frequently to improve on performance. The respondents were in agreement that employees are satisfied with technological changes with a mean of 3.63 and Standard deviation of 1.064; hence supporting the

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procurement Performance. The overall findings showed that Technological Use had effect on Procurement Performance by following up the ISO standards application with a mean of 4.13 and standard deviation of 0 .911.

According to Saxena (2003), handling of bulk files manually is very difficult inconvenient, time consuming and involves a lot of man hours. Retrieval of information is even more difficult from manual files, sometimes the data information is lost in the manual files and decisions are taken without considering all aspects of issues on hand.

Inferential Statistics

Table 2: Summary of Correlations

			Technology Use	Procurement Performance
Technology Use	Pearson Correlation		1	
	Sig. (2-tailed)			
	N	62		
Procurement Performance	Pearson Correlation	.528**		1
	Sig. (2-tailed)	.000		
	N	62		62

The correlation summary shown in Table 2 indicated that the affiliation between the independent variables and the dependent variable was significant.

Technology Use and Procurement Performance

First correlation analysis was carried out to ascertain whether Technology Use has any significant effect on Procurement Performance in Nzoia Sugar Company Limited; Kenya. Correlation results indicated that a strong positive significant relationship existed where (r) the correlation was 0.528 and Probabaility (p) reflected p less than 0.05 ($p < 0.05$). This led to the rejection of the null hypothesis and subsequently the adoption of the view that Technology Use Practice was instrumental in ensuring Procurement Performance.

Initiation of technology has been very important, E-Procurement as classified by Bailey (2008) are Web-based ERP (Enterprise Resource Planning). This deals with creating and approving purchasing requisitions, placing purchase orders and receiving goods and services by using a software system based on Internet technology. The second category is E-MRO (Maintenance, Repair and Operations) which deals with creating and approving purchasing requisitions, placing purchase orders and receiving non-product related MRO supplies. The third type is E-sourcing. This involves Identifying new suppliers for a specific category of purchasing requirements using Internet technology. The fourth type is E-tendering which involves sending requests for information and prices to suppliers and receiving the responses of suppliers using Internet technology. E-reverse auctioning is another type of e-procurement. This uses Internet technology to buy goods and services from a number of known or unknown suppliers. The sixth type is E-informing which involves gathering and distributing purchasing information both from and to internal and external parties using Internet technology. The last type of e-procurement, according to Bailey (2008), is E-market sites. Here, buying communities can access preferred suppliers' products and services, add to shopping carts, create requisition, and seek approval, receipt purchase orders and process electronic invoices with integration to suppliers' supply chains and buyers' financial systems.

Regression Analysis

The model summary on table 3 indicated a multiple linear correlation coefficient R of 0.548 which indicated that the independent variable (Technology Use) had a positive correlation with the dependent variable (Procurement Performance).

Table 3: Multiple Linear Regression Analysis Model Summaries

R	R Square	Adjusted R Square	Std. Error of the Estimate
.548[a]	.300	.263	2.37043

a. Predictors: (Constant), Technology Use Practices

The coefficient of determination (R Square) of 0.300 indicated that the independent variable constituted 30% of the variance in the dependent variable. These results therefore explained 54.8% while the 45.2% is explained by other variables outside the scope of this study.

Table 4: Summary of ANOVA

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	189.856	4	47.464	6.308	.000[b]
Residual	443.894	59	7.524		
Total	633.750	62			

a. Dependent Variable: Procurement performance
b. Predictors: (Constant), Technology Use

The results of Table 4 indicated that there is a significant difference between means of Supply Chain Practices on Procurement Performance in Nzoia Sugar Company Limited ($F_{o'}$ = 6.308> F_c = 2.50; $\alpha < 0.05$; df = 4, 59; p = 0.000< 0.05). This finding confirmed that the model predicted by Table 4 indicated that it is indeed significant.

Table 5: linear regression results

	Un-standardized Coefficients		Standardized Coefficients	T	Sig.
	Beta(β)	Std. Error	Beta(β)		
(Constant)	2.250	4.759		.473	.637
Technology Use	.444	.084	.511	5.295	.000

a. Dependent Variable: Procurement Performance

It can be deduced from the findings in Table 5 that Technology Use Practices (β = 0.444, ρ = 0.000< 0.05) was influencial on procurement performance. This indicated that the dependent variable, that is, the procurement performance would change by a corresponding number of standard deviations when the respective independent variables change by one standard deviation. The study therefore established that Technology Use Practice influences Procurement performance.

Hypothesis Testing

The first hypothesis was tested under the null hypotheses;

H_0: Technology Use Practices has no significant effect on Procurement Performance in Nzoia Sugar Company Limited; Kenya

The hypothesis was tested by ascertaining the relationship between Technology Use Practices and Procurement Performance using multiple regressions. The test was done at a significant level 0.05. The test results showed that there exists a statistically significant correlation between Technology Use Practices and Procurement Performance (β = 0.445, ρ = 0.000< 0.05). The result

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led to the rejection of the null hypothesis, hence a conclusion that there exists a significant effect of Technology Use Practices on Procurement Performance in Nzoia Sugar Company Limited; Kenya.

Constraints to finance are key hindrance to capital projects, specifically in third world countries. Savage, Fransman and Jenkins (2013) observed that most activities of procurement in the modern world are done online. Schapper *et al.,* (2006) argued that organizations within the third world countries are still left behind. Weak strategic alliances, poor infrastructure as well as change reluctance led to non-adoption and poor technological interchange in the third world countries.

CONCLUSIONS AND RECOMMENDATIONS

The objective was to examine the influence of Technology Use on Procurement Performance in Nzoia Sugar Company Limited; Kenya. Descriptive results revealed that Technology Use Practice is key to the factory in terms integration of departments for ease of information flow.The correlation results showed that a strong positive significant relationship existed, this led to the rejection of the null hypothesis and subsequently the adoption of the view that Technology Use practices are key for Procurement performance in Nzoia.The study results revealed a very strong approval of Technology Use Practices within the Nzoia Sugar Company Limited.

The study concluded that the company should use Technology Use Practice to improve on effectiveness and efficiency of Procurement activities that raises performance. The findings also concluded that the company improves on Technology Use practices for the better linkage of departments in terms of information interchange.

The study recommended that Technology Use Practices should build on its success on procurement activities, since it is a tool for Procurement Performance. The company should package its success on Technology practices because failure on information integration could lead to poor procurement performance.

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