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Abstract

The public sector in Kenya has changed supply chain operations as way of cutting wasteful spending and this has demanded government institutions including state corporations to be efficient in their operations by adopting innovative technologies. Technological innovation is, currently, recognized as one of the key factors on the firms' competitive advantage as well as a critical element in improving the economic and financial results of firms. This study therefore sought to investigate the influence of electronic sourcing on the performance of state corporations in Kenya. Descriptive research design was adopted. The target population was all the 187 state corporations in Kenya. Hence the study used a census. Semi-structured questionnaires were administered to collect qualitative and quantitative data. Secondary data was collected from reports. The questionnaires were tested for validity and reliability using 10% of the total sample respondents. Quantitative data was analyzed using both descriptive and inferential statistics and with the help of SPSS version 22 while qualitative data was analyzed descriptively. Multiple regression models were used to show the relationship between the dependent variable and the independent variables. The information was presented using tables and figures. The study concludes that electronic sourcing has a significant effect on the performance of state corporations in Kenya. From the results, this study recommends that the management of state corporations should ensure effectiveness in electronic Requisitions, online Catalogues & E-Market Research and online Vendor Evaluation.

Key Words: supply chain, electronic sourcing, state corporations, performance

Introduction

The study sets out to investigate the influence of electronic sourcing on performance of state corporations in Nairobi city county, Kenya. Supply chain automation covers every stage of purchasing, from the initial identification of a requirement, through the tendering process, to the payment and potentially the contract management (Porter & Millar, 2015). The purchasing of goods and services in the public sector is central because it supports all functions of government; each governmental unit needs supplies and equipment to accomplish its mission (Oliveira & Martins, 2011). Lysons (2013) opined that one of the most important challenges in government procurement is how to best utilize information technology in an age of communications revolution. Numerous researchers have discussed this challenge under the label e-procurement. The issue has been discussed both from a technological perspective and a managerial perspective (Lavelle & Bardon, 2010).

Organizations exist primarily to provide a service to society in return for certain economic rents which enable the firm to survive and prosper (Korir, 2009). How effectively organizations discharge their mandate in serving this interest determines the extent to which customers will be inclined to continue to be served by the organization while the efficiency in discharging determines the nature and amount of rents that accrue to the organization. These two elements underpin the competitive advantage of firms (Kar, 2010). The multi-faceted nature of organization performance and its measure is likely to become even more complex

as technology adoption, environmental complexity and stakeholder expectations about companies' economic, social and environmental responsibilities change (Helen & Christine, 2010)

According to Croom and Brandon (2014), adoption of e-procurement technology in an organization enables a firm to organize its interactions with its most crucial suppliers, a set of built in monitoring tools to help control costs, assure maximum supplier performance and keeping an open line of communication with potential suppliers during a business process all of which contribute to the attainment and sustenance of competitive advantage. Bryan (2011) argues that there is a direct relationship between performance contracting and corporate performance.

In fact, implementation rate of public procurement systems has been slow and many government agencies tend to overstate the degree to which they are involved in e-Procurement (Croom & Brandon, 2014). Despite the benefits that can be achieved from a successful e-procurement implementation in the public sector, the business press has reported a number of failures of e-procurement initiatives in a number of state agencies in the USA, UK and New Zealand in recent years. As observed by Dai and Kauffman (2010) e-procurement will result in large investments of time and money, without absolute certainty that its full potential will be achieved every time.

In Kenya, performance measures were based on price variation which is outdated and rejects on receipt and on time delivery. For many years, the selection of product choice was mainly based on price competition with less attention afforded to other criteria like market share and reliability (Rotich, 2011). The evaluation of performance in the context of the supply chain (efficiency, flow, integration, market share, responsiveness and customer satisfaction) involves measures important at the strategic, operational and tactical level. Strategic level measures include lead time against whole industry operations, quality level, cost saving initiatives and supplier pricing against market (Githumbi, 2013).

Tactical level measures include the efficiency of purchase order cycle time at departmental levels, booking in procedures, cash flow, quality assurance methodology and capacity flexibility (Korir, 2009). Operational level measures include ability in day to day technical representation, adherence to developed schedule, ability to avoid complaints and achievement of defect free deliveries. Purchasing and supply management must analyze on a periodic basis their performance abilities to meet the firm's long-term needs. The areas that need particular attention include the organization's general growth plans, future design capability in relevant areas, role of purchasing and supply management in the organization's strategic planning, potential for future production capacity and financial ability to support such growth (Makau, 2014).

Statement of the Problem

Kenya's long term development agenda spelt out in the vision 2030, targets an annual growth rate of above 10% with an investment rate of 30%, state corporations are key drivers in this projected growth. State corporations accounted for 20% of the country's GDP, provided employment to about 4 Million persons (GoK, 2016). However, state corporations in Kenya have been experiencing a myriad of problems including misappropriation and blatant mismanagement of resources (Rotich, 2011).

The systems audit for State law Office (SLO) report revealed losses of Kshs.18 Million through irregular manual procurements in financial year (FY) 2008/2009. Earlier, in the FY 2007/2008, SLO had lost Kshs.8 Million due to manual procurement related inefficiencies. This raises questions on the level of performance of SLO's procurement manual system as a

state corporation. This situation is hampering sustained performance and service delivery (PPOA, 2014).

According to an annual Kenya Power customer satisfaction survey of 2012 and 2013, carried out by a contracted vendor, it is notable that the satisfaction percentage index has been fluctuating towards more and more dissatisfaction, that is, 69% and 66% respectively (Makau, 2014). On the other hand, Kenya Power faces a major challenge in controlling the overall sourcing costs because of the constant increase due the manual sourcing procedures; this is evident by Kenya Power posting a decrease in profit prior to tax of Ksh.6 Billion compared to Ksh.8 Billion noted in the previous year (OECD, 2010).

The problem of poor productivity and the absorption of excessive portion of the budget among state corporations represents a drain on the exchequer meager resources and also results into non delivery on intended services. This has a negative implication on the welfare of Kenyan citizens and may also imply that Vision 2030 is not met (KIPPRA, 2016). According to Wakoli (2012) 69% of state corporations rely on old and manual records in selecting their suppliers, while only 31% search through online catalogues in evaluating suppliers, which is one of the reasons for loss, fraud and gross mismanagement of state resources.

However, in the UK, previous research by Griffin, Foster and Halpin (2014) on the survey of the influence of supply chain automation usage strategy shows that global state corporations' use of the supply chain automation is high, while in Kenya, previous research by Githumbi (2013) on usage, obstacles and policies on supply chain automation show that only 33% of state corporations have implemented supply chain automation as a strategy to improving services. It is against this backdrop, the present study sets out to investigate the influence of supply chain automation on performance of state corporations in Kenya.

Specific Objective

- i. To establish the influence of electronic sourcing on the performance of state corporations in Kenya.

Theoretical Review

The Dynamic Capability Theory

This theory was developed by Gary Pisano and Amy Shuen, in their 1997 paper "Dynamic Capabilities and Electronic Supply Chain Management". Dynamic capability theory elaborates the organizations ability to deliberately optimize its resources. The ability of a firm to integrate, develop and leverage on the environmental competitive advantage to adapt to its dynamism according to Bagozzi and Lee (2010).

Electronic sourcing integrates the in-house and external procurement components to address dynamics in the way organizations achieve operational excellence by reducing cost and saving on time used to procure goods and services in state corporations, this includes aspects such as; electronic requisitions, electronic catalogues and online vendor evaluation. These are the modern day dynamic capabilities (Bradley, 2015).

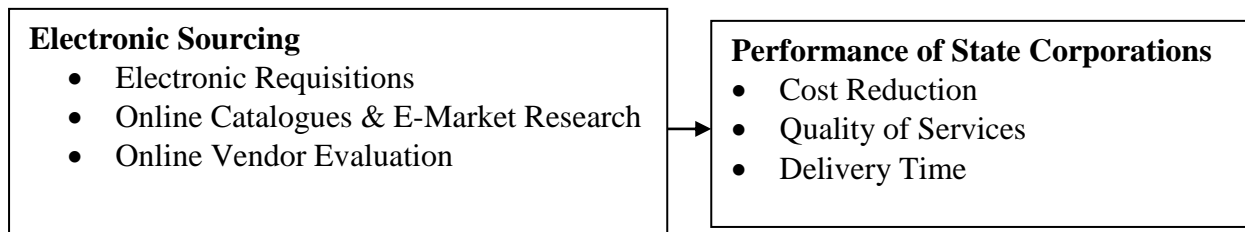
Dynamic capability is a theory of competitive advantage in rapidly changing environments (Boer & Heijboer, 2012). It examines the scope conditions of dynamic capability; that is, when the theory has more and less explanatory power. It finds that dynamic capability has greatest explanatory power when a partially foreseeable technological change is on the verge of transforming market competition such as online vendor evaluation; and less explanatory power when dynamic capabilities are not undervalued and in markets that reward short bursts

of performance over long-term persistence, such as electronic catalogues (Hawking & Foster, 2014).

The attractiveness of the dynamic capability concept stems from its' potential to connect the resource-based view of the firm with the emerging knowledge economy aspects such as electronic sourcing, discourse prevalent in contemporary debate. It appears to offer a means of realizing Mahoney's (2005) belief that "economics based research (the management of resources) and research on organizational learning (the resources of management) need to be joined in the next generation of resource-based research." Therefore electronic sourcing is one of the angles that both approaches have a mutual focal point hence its relevance in this study (Wang, Chang & Heng, 2014).

The dynamic capability theory is appropriate for this study because it articulates issues propagating the use of electronic sourcing. The theory was used to examine factors that accelerate the optimization of electronic sourcing and how these influence performance of state corporations.

Conceptual Framework



Electronic Sourcing

The attributes of e-sourcing which will be taken into consideration in this study are: supplier portals, electronic requisitions and online catalogues. Premkumar (2009) in his study argues that e-sourcing is the process of identifying next supplies for a specific spend category, using internet technology usually the internet itself. By identifying new suppliers a purchaser can increase the competitiveness in the tactical purchasing process for this spend category hence improve supply chain performance (Ribeiro & Henriques, 2011).

Songip, Lau, Jusoff and Ramli (2013) argue that e-sourcing is the process of creating and approving purchasing requisition, placing purchase orders as well as receiving goods and services ordered, by using a software system based on internet technology which greatly improves the supply chain performance. In the case of e-sourcing, the goods and services ordered are indirect goods and services i.e., non-product related goods and services (Van Weele, 2010). The supporting software system an ordering catalogue system is usually used by all employees of an organization. In case of enterprise resources planning the goods and services ordered are product related. It may be noted that ordering of direct goods and services usually is plan-based. Electronic ordering is ideal for customers wishing to develop an automated purchasing system for orders (Salford *et al.*, 2010).

By eradicating repetitive manual processes and removing the need for paperwork, electronic ordering solution enables the business to reduce costs, increase productivity and improve customer service thus improved supply chain performance (Porter & Millar, 2015). Mentzer (2010) asserts that online ordering system is an e-commerce function where a company allows customers to order products or services via their website. Since the Internet is booming, having an online ordering system can boost sales to some extent as it eases customers to place an order for the company's services. Consumers can place orders from

their home as long as they have a computer/laptop with Internet connection thus improved supply chain performance (Minahan *et al.*, 2011).

Electronic sourcing does more than establish an electronic venue for buyers and sellers to meet. It also streamlines workflows, enhances flexibility and drives transparency in the buyer seller relationship (Moon, 2015). That knowledge makes for more informed negotiations and richer arbitrage opportunities hence improving the supply chain performance (Wong & Sloan, 2014). Finally, e-sourcing frees up purchasing personnel to focus on more strategic concerns such as supply base development and relationship management, linking suppliers into up-front innovation processes and value chain restructuring (Songip *et al.*, 2013).

Performance of State Corporations

The attributes of performance which will be taken into consideration in this study are: cost reduction, quality of services and delivery time. Odhiambo and Kamau (2013) identified seven key success factors which influence performance, namely; a clear procurement strategy, effective management information and control systems, development of expertise, a role in corporate management, an entrepreneurial and proactive approach, co-ordination and focused efforts (Rotich, 2011). This should be based on total cost, quality, and enhancement of competitiveness of suppliers using best practices.

Information technology adoption and effective use has an impact on performance (Rajkumar, 2010). According to Korir (2009), decisions to buy instead of make to improve quality, lower inventories, integrate supplier and buyer systems, and create co-operative relations underline need for good performance. Recent trends are to fewer suppliers; long-term contracts, e-procurement, and continuing improvement in quality, price, and service require closer co-ordination and communication between key procurement partners (Kumar & Markeset, 2009). Supplier switching for lower prices may not result in the best long-term value. Sharing information and assisting suppliers to improve performance is a necessity for world-class performance (Knudsen, 2010).

Bradley (2015) asserted that basing on financial performance and neglecting non-financial performance cannot improve the operations because only partial performance is considered. Realization of goals is influenced by internal and external forces (Chan & Ngai, 2016). Interactions between various elements; professionalism, staffing levels and budget resources, procurement organizational structure, regulations, rules, and guidance, and internal control policies, all need attention and influence performance (Awino *et al.*, 2012).

Moon (2015) distinguished features of a responsive organization. Major transformations are; from functions to process, profit to performance, products to customers, inventory to information, and transactions to relationships. Critical measures of procurement performance need to be continuously monitored (Mentzer, 2010). The idea of 'key performance indicators' framework suggests that whereas there are many measures of performance to be deployed in an organization, only a small number of critical dimensions contribute more than proportionately to success or failure (Noor, Guyo & Amuhaya, 2014).

Njoroge (2010) maintained that there is a link between e-procurement process, efficiency, effectiveness and performance. Performance starts from purchasing efficiency and effectiveness in the procurement function in order to change from being reactive to being proactive to attain set performance levels in an entity (Pearson & Grandon, 2015). Performance provides the basis for an organization to assess how well it is progressing towards its predetermined objectives, identifies areas of strengths and weaknesses and decides on future initiatives with the goal of how to initiate performance improvements (Wakoli, 2012).

Empirical Review

According to Mose (2012), private and public sector organizations have been utilizing information technology systems to streamline and automate their purchasing and other processes over the past years. E-sourcing is not new; Thai (2014) there have been many attempts to automate the process of procurement for the buyer using electronic procurement systems, workflow systems and links with suppliers through supplier portals. E-sourcing refers to the electronic integration and management of all procurement activities including purchase, request, authorization, ordering, delivery and payment between a purchaser and a supplier (Lysons, 2013).

A significant expenditure of public funds occurs in the procurement of goods, services and works. Public entities, as buyers, have a duty of care and trust in expending those funds. Further, not all the technology is in place yet to enable the government to take full advantage of internet commerce (PPOA, 2014). The PPOA in 2010 identified issues in identification of parties in a transaction, synchronization, confidentiality, data integrity and bandwidth as the major considerations that the government had to make before taking full advantage of the benefits of e-procurement.

The notion of e-sourcing adoption into the organization structure has been supported by the results of empirical studies. Issa *et al.*, (2013) found that the process of supply chain integration is followed by a reduction in the number of suppliers. Mentzer (2010) concluded that firms indeed benefit from reduced coordination and search costs, but in some contexts buyers still maintain close relationships with selected suppliers and various business models continue to co-exist.

Research Methodology

The study adopted a descriptive research design since the study gathered quantitative and qualitative data. The target population was the 187 state corporations spread over different locations in Kenya. This provides clear picture of the differences in the characteristics of the population under study. The unit of analysis was the individual state corporations while the unit of observation which defines the independent elements in a population was the key informants within each of the selected state corporations. The unit of observation is selected because they are the ones involved in execution of the firms' supply chain automation practices and thus stands high chances of providing reliable information on the influence of supply chain automation on performance of state corporations in Kenya. The sampling frame was a list of all the 187 state corporations operating in Kenya categorized according to their mandate that is, 55 commercial, 62 executive agencies, 25 independent regulatory agencies and 45 higher education, research and training institutions. The sampling frame was obtained from the ministry of finance website.

The study employed a census approach to collect data from the respondents hence no sampling techniques were used. The sample size was all 187 respondents in the 187 state corporations. Unit of observation was key informants in these corporations. Primary data was collected and in some cases verification was done using secondary information from the state corporations' websites. Primary data was collected using questionnaires containing both open-ended and closed-ended questions with closed ended section of the instrument utilizing both likert scale format and rank-order scale.

The study generated both quantitative and qualitative data. Both descriptive statistics and inferential statistics were applied to analyze numerical data gathered. Statistical Package for Social Sciences (SPSS) program version 22 was used as a tool for analysis of study variables.

Correlation analysis to establish the relationship between the independent and dependent variables were employed. Regression was used to model the relationship between explanatory variables and a response variable by fitting a linear equation to the observed data

Analysis and Interpretation of Data

From the 187 questionnaires 171 were completely filled and returned hence a response rate of 91.4%. The response rate was considered as suitable for making inferences from the data collected. As indicated by Metsamuuronen (2017), a response rate that is above fifty percent is considered adequate for data analysis and reporting while a response rate that is above 70% is classified as excellent. Hence, the response rate of this study was within the acceptable limits for drawing conclusions and making recommendations

Descriptive Statistics Analysis

Electronic Sourcing and the Performance of State Corporations

The first specific objective of the study was to establish the influence of electronic sourcing on the performance of state corporations in Kenya. The respondents were requested to indicate their level of agreement on various statements relating to electronic sourcing and the performance of state corporations in Kenya. A 5 point Likert scale was used where 1 symbolized strongly disagree, 2 symbolized disagree, 3 symbolized neutral, 4 symbolized agree and 5 symbolized strongly agree. The results were as presented in Table 1.

From the results, the respondents agreed that online vendor evaluation plays a significant role in improving quality of services. This is supported by a mean of 3.986 (std. dv = 0.029). In addition, as shown by a mean of 3.958 (std. dv = 1.119), the respondents agreed that electronic requisitions play a significant role in improving delivery time. Further, the respondents agreed that electronic requisitions play a significant role in improving quality of services. This is shown by a mean of 3.789 (std. dv = 0.876). The respondents also agreed that online catalogues and e-market research plays a significant role in improving quality of services. This is shown by a mean of 3.748 (std. dv = 1.008). The respondents agreed that Online catalogues and e-market research plays a significant role in cost reductions. This is supported by a mean of 3.631 (std. dv = 0.904). In addition, as shown by a mean of 3.596 (std. dv = 0.937), the respondents agreed that online vendor evaluation plays a significant role in cost reductions. Further, the respondents agreed that electronic requisitions play a significant role in cost reductions. This is shown by a mean of 3.526 (std. dv = 0.840).

Table 1: Electronic Sourcing and the Performance of State Corporations

	Mean	Std. Deviation
Electronic requisitions play a significant role in cost reductions	3.526	0.840
Online catalogues and e-market research plays a significant role in cost reductions	3.631	0.904
Online vendor evaluation plays a significant role in cost reductions	3.596	0.937
Electronic requisitions play a significant role in improving quality of services	3.789	0.876
Online catalogues and e-market research plays a significant role in improving quality of services	3.748	1.008
Online vendor evaluation plays a significant role in improving quality of services	3.986	0.029
Electronic requisitions play a significant role in improving delivery time	3.958	1.119
Aggregate	3.738	0.873

Performance of State Corporations in Kenya

The respondents were requested to indicate their level of agreement on various statements relating to performance of state corporations in Kenya. A 5 point Likert scale was used where 1 symbolized strongly disagree, 2 symbolized disagree, 3 symbolized neutral, 4 symbolized agree and 5 symbolized strongly agree. The results were as presented in Table 2.

From the results, the respondents agreed that they are satisfied with the quality of services provided in our organization. This is supported by a mean of 3.969 (std. dv = 0.851). In addition, as shown by a mean of 3.938 (std. dv = 0.563), the respondents agreed that the quality of services has improved over the years. Further, the respondents agreed that there are no long queues since most of the operations in our organization have been automated. This is shown by a mean of 3.854 (std. dv = 1.327). The respondents also agreed that service delivery time has greatly reduced over the years. This is shown by a mean of 3.818 (std. dv = 0.986).

From the results, the respondents agreed that cost of procurement has greatly reduced over the years. This is supported by a mean of 3.805 (std. dv = 0.830). In addition, as shown by a mean of 3.684 (std. dv = 0.997), the respondents agreed that supply chain automation has led to cost reduction in our organization

Table 2: Performance of State Corporations in Kenya

	Mean	Std. Deviation
Supply chain automation has led to cost reduction in our organization	3.684	0.997
Cost of procurement has greatly reduced over the years	3.805	0.830
The quality of services has improved over the years	3.938	0.563
Am satisfied with the quality of services provided in our organization	3.969	0.851
There are no long queues since most of the operations in our organization have been automated	3.854	1.327
Service delivery time has greatly reduced over the years	3.818	0.986
Aggregate	3.849	0.818

Inferential Statistics

Correlation Analysis

The present study used Pearson correlation analysis to determine the strength of association between independent variables (electronic sourcing, electronic informing, electronic supplier relationship management and electronic payments) and the dependent variable (the performance of state corporations in Kenya) dependent variable. Pearson correlation coefficient range between zero and one, where by the strength of association increase with increase in the value of the correlation coefficients. The current study employed Taylor (2018) correlation coefficient ratings where by 0.80 to 1.00 depicts a very strong relationship, 0.60 to 0.79 depicts strong, 0.40 to 0.59 depicts moderate, 0.20 to 0.39 depicts weak.

Table 3: Correlation Coefficients

		Organization Performance	Electronic Sourcing
Organization Performance	Pearson Correlation		1
	Sig. (2-tailed)		
	N	171	
Electronic Sourcing	Pearson Correlation	.818**	1
	Sig. (2-tailed)	.002	
	N	171	171

From the results, there was a very strong relationship between electronic sourcing and the performance of state corporations in Kenya ($r = 0.818$, p value = 0.002). The relationship was significant since the p value 0.002 was less than 0.05 (significant level). The findings are in line with the findings of Rajkumar (2018) who indicated that there is a very strong relationship between electronic sourcing and organization performance.

Regression Analysis

Multivariate regression analysis was used to assess the relationship between independent variables (electronic sourcing, electronic informing, electronic supplier relationship management and electronic payments) and the dependent variable (the performance of state corporations in Kenya)

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.928	.861	.862	.10582

a. Predictors: (Constant), electronic sourcing, electronic informing, electronic supplier relationship management and electronic payments

The model summary was used to explain the variation in the dependent variable that could be explained by the independent variables. The r-squared for the relationship between the independent variables and the dependent variable was 0.861. This implied that 86.1% of the variation in the dependent variable (the performance of state corporations in Kenya) could be explained by independent variables (electronic sourcing, electronic informing, electronic supplier relationship management and electronic payments).

Table 5: Analysis of Variance

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	172.027	4	43.007	346.83	.002 ^b
1 Residual	20.568	166	.124		
Total	198.595	170			

a. Dependent Variable: Organizational Performance

b. Predictors: (Constant), electronic sourcing, electronic informing, electronic supplier relationship management and electronic payments

The ANOVA was used to determine whether the model was a good fit for the data. F calculated was 346.82 while the F critical was 2.426. The p value was 0.002. Since the F -calculated was greater than the F -critical and the p value 0.002 was less than 0.05, the model was considered as a good fit for the data. Therefore, the model can be used to predict the

influence of electronic sourcing, electronic informing, electronic supplier relationship management and electronic payments on the performance of state corporations in Kenya.

Table 6: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	0.134	0.039		0.872	0.001
electronic sourcing	0.387	0.112	0.384	3.545	0.003

a Dependent Variable: Organization Performance

The regression model was as follows:

$$Y = 0.134 + 0.387X_1 + \varepsilon$$

From the results, electronic sourcing has a significant effect on the performance of state corporations in Kenya $\beta_1=0.387$, p value= (0.000). The relationship was considered significant since the p value 0.000 was less than the significant level of 0.05. The findings are in line with the findings of Rajkumar (2018) who indicated that there is a very strong relationship between electronic sourcing and organization performance.

Conclusions

The study concludes that electronic sourcing has a significant effect on the performance of state corporations in Kenya. Findings revealed that electronic Requisitions, online Catalogues & E-Market Research and online Vendor Evaluation influence the performance of state corporations in Kenya

Recommendations

The study found that electronic sourcing has a significant effect on the performance of state corporations in Kenya. This study therefore recommends that the management of state corporations should ensure effectiveness in electronic Requisitions, online Catalogues & E-Market Research and online Vendor Evaluation.

Suggestions for Further Studies

This study focused on the influence of supply chain automation on performance of state corporations in Kenya. Having been limited to state corporations in Kenya, the findings of this study cannot be generalized to other private companies in Kenya. The study therefore suggests further studies on the influence of supply chain automation on performance of private companies in Kenya.

Further, the study found that the independent variables (electronic sourcing, electronic informing, electronic supplier relationship management and electronic payments) could only explain 86.1% of the performance of state corporations in Kenya. This study therefore suggests research on other factors affecting the performance of state corporations in Kenya.

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