



ROLE OF INFORMATION TECHNOLOGY ON SUPPLY CHAIN PERFORMANCE IN PUBLIC INSTITUTIONS IN KENYA: A CASE OF THE JUDICIARY OF KENYA

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Abstract: This study sought to analyze the role of information technology in supply chain performance in public institutions in Kenya. The specific objective for this study were to determine the influence of electronic data interchange, e-tendering, supply chain integration and enterprise resource planning on supply chain performance in public institutions in Kenya. The study applied the research design where both qualitative and quantitative techniques were used. This study used a survey research design. The target population for this study was 159 staff working in 7 directorates in the Judiciary in Nairobi County. This research study used census survey sampling frame to select the targeted population from the 7 seven departments who were directly and indirectly involved. The study used structured and semi-structured instruments to collect both primary and secondary data. The collected data was analyzed with the help of a Statistical Package for Social Sciences (SPSS) version 21. Data was analyzed with the help of multiple regression and analysis for variance. The study used descriptive statistics, inferential statistics, frequency, mean, standard deviation and percentages. The results from the quantitative data were presented through a form of tables. The study results indicated that electronic data interchange has a significant influence on supply chain performance in the Judiciary of Kenya ($\beta_1=0.290$, $p\text{-value}=0.005$). In addition, the study established that electronic tendering has a significant influence on supply chain performance in the Judiciary of Kenya ($\beta_2=0.263$, $p\text{-value}=0.022$). The study also established that supply chain integration has a significant influence on supply chain performance in the Judiciary of Kenya ($\beta_3=0.102$, $p\text{-value}=0.017$). The study revealed that enterprise resource planning has a significant influence on supply chain performance in the Judiciary of Kenya ($\beta_3=0.404$, $p\text{-value}=0.000$). The study recommends that the Judiciary of Kenya should enhance the use of supply chain integration and joint decision making as a way of enhancing supply chain performance in public institutions. In addition, the organization should automate all its operations so as to improve supply chain performance.

Key Words: Supply chain performance, Electronic Data Interchange, E-tendering, Supply Chain Integration.

Introduction

The management of supply chain represents a significant change in the way organizations view themselves and has witnessed values created through the integration and coordination of supply, demand and relationships in order to satisfy customers in an effective and profitable manner both in the private and public sectors (Chirchir, 2014). The concept has received interest among organizations including the public sector. In order to achieve the optimal level of service efficiency and ensure cost minimization in the supply chain, there is a need to eliminate unnecessary activities. Information technology offers the promise of fundamentally changing the

lives of much of the world's population (Moharana, Murty, Senapati & Khuntia, 2013). In its various forms, information technology affects many of the processes of business and government, how individuals live, work and interact, and the quality of the natural and built environment. The use of technologies such as ERP systems, electronic payment systems and bar coding is on the rise as many companies seek ways to track their supply chain distributions (Auram, Inkilainen, Kauremaa, Karkkainen & Laukkanen, 2012). Maintaining information across the chain is the most critical aspect. According to Taghva, Jafarian and Nikabad (2012), supply chain management should be a "win-win" game in which the organization and its external suppliers and customers enjoy the interaction. Information technology solutions are used in managing distribution and supply chains in order to increase efficiency while reducing waste in value chains.

Organizations can use information technology solutions in the management of supplier networks, facilitating traceability and managing distributions networks. Nowadays, competition is no longer company to company but supply chain to supply chain. Industries find that they have to rely on effective supply chain management to compete globally (Piderit, Flowerday & Solms, 2011). The globalization of supply chains has forced companies to look for better and more inter-linked systems between supply chain management competencies, multiple supply chain management strategies and the implementation processes and supply chain management capabilities to coordinate the flow of materials into and out of the company as opposed to the fragmented systems, which have characterized many organizations (Ochara, 2011).

The use of information technology in supply chain management has been adopted in various parts of the world. For example, countries such as the UK, US and Canada have for long employed information technology in the management of their procurement and logistics. In India Moharana *et al.*, (2013) argue that in order to deliver quality information to the decision-maker at the right time and in order to automate the process of data collection, collation and refinement, organizations have to make Information Technology an ally, harness its full potential and use it in the best possible way. IT is beneficial for cooperation and integration within the stakeholders of the supply chain. In Finland, Auramo *et al.*, (2012) indicate that the use of information technology (IT) is considered a prerequisite for the effective control of complex supply chains. Supply chain is majorly used in transaction processing, supply chain planning and collaboration, and order tracking and delivery coordination. In addition, a study conducted by Taghva *et al.*, (2012) in Iran showed that different dimensions of Information Security Management Systems (information uniformity and prevent the human and machine mistake) had impact on four dimensions of supply chain performance (customers, financial, internal processes and learning and growth) in three levels (strategic, technical, and operational) in supply chain.

The use of information technology in supply chain and supply chain management has also been adopted in Africa. For instance, Piderit, Flowerday and Solms (2011) indicated that there is a relationship between trust and information sharing in South African automotive supply chains and information technology plays a key role in supporting this relationship. In Uganda, a study conducted by Ochara (2011) established that information technology integration was positively influencing supply chain agility in the medical supplies industry. In Ghana, Alimohamadian and Abdi (2014) established that top management support of IT and employees' general IT skills factors of IT enhance ERP success, and ERP success positively influences on Supply Chain

Integration. Therefore, these two IT factors influence Supply Chain Integration through ERP success.

In Kenya, various organizations, both in the private and public sector, have adopted information and communication technology in supply chain management. In British American Tobacco Kenya Ltd, Nagery (2012) established that the adoption of ICT had increased the information processing capabilities of suppliers, thereby enabling or supporting greater relationship in addition to reducing uncertainty. In addition, Chirchir (2014) argues that adoption of IT systems like Radio Frequency Identification (RFID) and Global Positioning Systems (GPS) in supply chain affect supply chain performance significantly. Despite the interest and employment of information technology in public institutions, Richey, Adams and Dolci and Gastaud (2014) assert that much has not been done on its influence on supply chain performance as compared to the private sector. There has been numerous uproar and reports in the Kenyan local publications regarding fraudulent practices in public institutions which further cast doubt on the credibility of the supply chain management performance. The Judiciary being one of the public institutions has been in the limelight for all the wrongs in supply chain management performance. It is an arm of the Kenyan government that derives its mandate from the constitution of Kenya, article 159 (Auditor General Report, 2014). It is charged with responsibility of delivering justice to Kenyans and will be a key enabler for the country's vision according to Kenya's vision 2030 blueprint that was launched in 2008. Effective supply chain management in the Judiciary will therefore bring about great positive impact in the achievement of Kenya's vision 2030.

Statement of the Problem

The problem of Information Technology (IT) has been revolving in the supply chain performance in public institutions in Kenya. Kemunto (2014) argues that there has been a rise in complaints by the public, professionals and other stakeholder's about the supply chain performance within the public institutions in Kenya and hence the need for improvement. Public Institutions in Kenya have for a long time been struggling with serious issues of poor IT supplier performance where cases of malpractices have been reported (WB, 2013). In Public Institutions information sharing is rigid because of the bureaucratic structures and overreliance on manual ways of communication which has affected supply chain management performance because of delay of information from one entity to the other and hence the importance of the adoption of information technology (Mwirigi & Were, 2014).

According to Makau (2014), the Judiciary of Kenya has been having delays in rulings and judgments for the last 2 decades. In particular the delays in determination of cases have resulted in a huge case backlog thereby confirming the famous Maxim "justice delayed is justice denied." According to Mutunga (2012) the case backlogs constitute the single most important source of public frustration with the Judiciary. According to Makau (2014), backlog of cases up to 2014 were more than 650,000 cases in all courts and the backlog has not been reducing but increasing from year to year. According to the Annual Judiciary report (2014), the incipient corruption in the administrative cadres in the Judiciary is one of the factors contributing to poor performance. For instance, according to Auditor General's report (2014), a tender specifications for 34,400 square feet at a cost of Sh50 million in the Judiciary translated into a lease agreement for 47,890 square feet at a cost of Sh70 million to the Kenyan tax payer, which is a 27.58% increase in the

initial cost. The report also quoted the advance payment of contractors, including a Sh43 million payment to a contractor for the construction of a court in Mavoko before land was secured (Annual Judiciary report, 2014). In addition, it is difficult to trace historical records relating to various procurements that have been undertaken by the Judiciary.

Despite the poor performance in the public institutions supply chain, there is little known empirical study on the role of information technology in supply chain performance in public institutions in Kenya and the studies available are from western or developed country. There is need to do a study in this area so as to get gravity literature in the Kenyan context. This study therefore tends to fill the gap by examining the role of Information Technology on supply chain performance in public institutions in Kenya by focusing on the Judiciary of Kenya. The specific objectives of the study were:

- i. To determine the role of electronic data interchange in supply chain performance in public institutions in Kenya
- ii. To establish the role of e-tendering in supply chain performance in public institutions in Kenya
- iii. To find out the role of supply chain integration in supply chain performance in public institutions in Kenya
- iv. To assess the role of enterprise resource planning in supply chain performance in public institutions in Kenya

Theoretical Review

This study was based on the following theories; Innovation Diffusion Theory, Relational Exchange Theory, Transition cost theory and Network Effect Theory.

Innovation Diffusion Theory

Innovation diffusion theory is considered to be relevant in understanding the effect of electronic data interchange on IT performance of supply chain management in Kenya and hence giving a theoretical background for this study. According to Myrdal (1957), Diffusion of Innovation (DOI) Theory, developed by Rogers in 1962, is one of the oldest social science theories. It originated in communication to explain how, over time, an idea or product gains momentum and diffuses (or spreads) through a specific population or social system. The end result of this diffusion is that people, as part of a social system, adopt a new idea, behavior, or product. Adoption means that a person does something differently than what they had previously (purchase or use a new product, acquire and perform a new behavior). The key to adoption is that the person must perceive the idea, behavior, or product as new or innovative. It is through this that diffusion is possible. Adoption of a new idea, behavior, or product does not happen simultaneously in a social system; rather it is a process where some people are more apt to adopt the innovation than others. Researchers have found that people who adopt an innovation early have different characteristics than people who adopt an innovation later (Tamimi, 1993). The assimilation of e-tendering 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 information systems (Tamimi, 1993). As

indicated in the innovation diffusion theory the relative advantage, ease of use and compatibility of e-tendering significantly influence lead time, customer satisfaction and reduces cost of procurement.

Relational Exchange Theory

Relational exchange theory is considered to be relevant in understanding the effect of e-tendering on IT performance of supply chain management in Kenya and hence giving a theoretical background for this for this study. According to Tamimi (1993) integration of internal process with external supply chain network could be improved through communication, partnerships, alliances and cooperation. The pillars of supply chain integration are cooperation, collaboration, information sharing, trust, partnership, shared technology, and a fundamental shift away from managing individual function processes, to managing integrated chains of process. Relational exchange theory (RET) offers the notion of embeddedness in a relationship, which evokes a “moral control” Myrdal (1957) that diminishes the desire for opportunism between trading partners. Relational exchange theory proposes the nature of the exchange relationship between entities is directed by the level of expectation that the relationship will be rewarding. The concept of embeddedness in social relationships explains the departure from “pure economic motives” as firms “become overlaid with social content that carries strong expectations of trust and abstention from opportunism”. The relation exchange theory is used to explain the supply chain integration and its effect of supply chain performance. As indicated in the relational exchange theory the nature of the exchange relationship between entities is directed by the level of expectation that the relationship will be rewarding (Myrdal, 1957). When well established, the relationship leads to cooperation, collaboration, information sharing, trust and partnership between the suppliers and public institutions. This in term leads to an improvement in supply chain performance in terms of customer satisfaction and cost minimization.

Transaction Cost Theory

Transaction cost theory is considered to be relevant in understanding the effect of supply chain integration on IT performance of supply chain management in Kenya and hence giving a theoretical background for this for this study. According to Perroux (1950), transaction costs can be divided into coordination costs and transaction risk. Coordination costs are the direct costs of integrating decisions between economic activities (such as search and bargaining costs). Transaction risk is associated with the exposure to being exploited in the relationship (Myrdal, 1957). Uncertainty and asset specificity are two factors, which increase coordination costs and transaction risk, respectively. The use of information technology has facilitated the reduction of coordination costs, which has been extensively documented in the literature. For example, electronic market places, facilitated through IT, reduce the cost of searching for obtaining information about product offerings and prices (Tamimi, 1993). The adoption of enterprise resource planning system reduces the cost of searching for obtaining information about product offerings and prices, which eventually leads to cost minimization in the whole supply chain.

Network Effect Theory

Network effect theory is considered to be relevant in understanding the effect of enterprise resource planning on IT performance of supply chain management in Kenya and hence giving a

theoretical background for this for this study. According to Perroux (1950) suggest that the actions of a firm may depend on the collective actions of other firms. The value of a technology with network effect is dependent on the number of others using it. The size of the network of firms using a particular technology with network effect is affected by the benefits that adopters derive from using technology, while the benefits depend on the size of the network. Examples of technology with network effect are e-mail and EDI. Network effects were conceptualized as peer adoption (adoption at other levels of the supply chain). Trading community influence was found to be a stronger determinant than peer adoption. In this study, network effect theory is used to explain the adoption of electronic data interchange in public institutions. A network of stakeholders in the supply chain is paramount in electronic data interchange (Perroux, 1950). However, the electronic data interchange can be affected by other factors such as the level of trust among stakeholders in the network. This can also be affected by the compatibility of the information systems used by each of the stakeholders. This implies that implies that electronic data interchange in a supply chain necessitates high level of trust and implementation of compatible information systems among stakeholders in a supply chain.

Conceptual Framework

This study seeks to analyze the role of information technology on supply chain performance in public institutions in Kenya. The independent variables will be electronic data interchange, e-tendering, supply chain integration and enterprise resource planning. On the other hand, the dependent variable will be supply chain performance in public institutions.

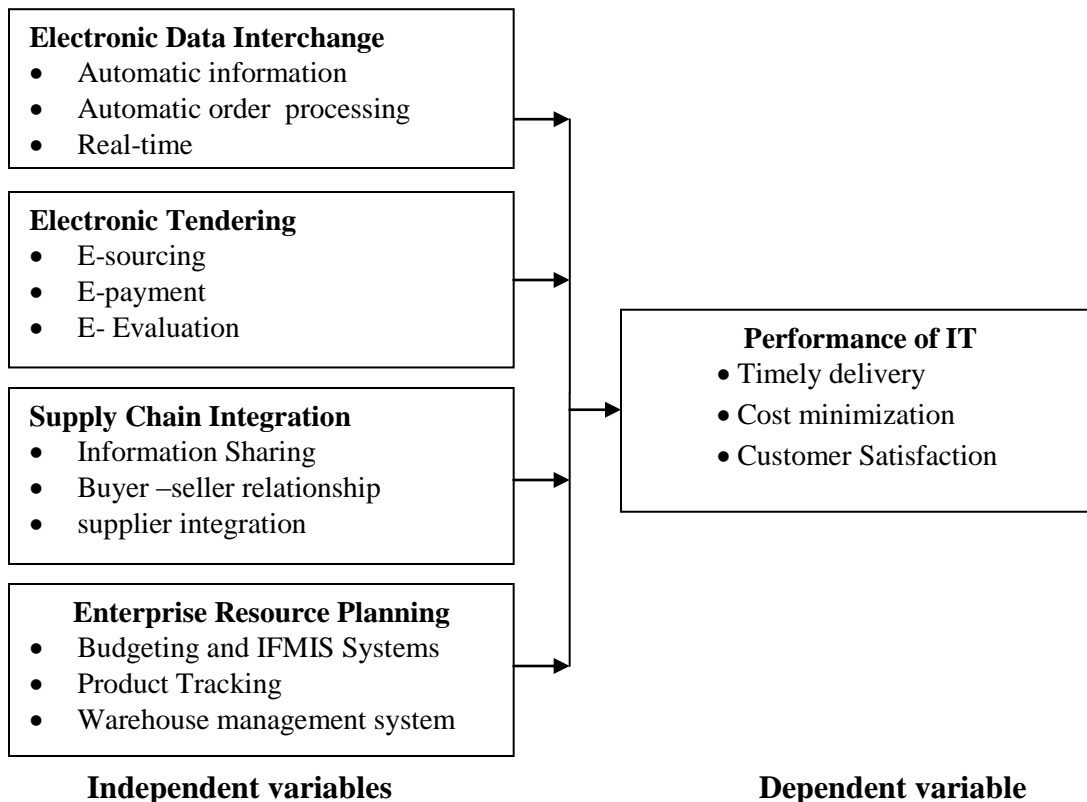


Figure 1: Conceptual Framework

Electronic Data Interchange

Supply Chain Management places an emphasis on the flow of both information and material, synchronized to the customer's requirements, from raw materials to the end consumer. In effect, SCM blurs the traditional boundaries that exist between supply chain entities through inter-firm activities such as: sharing of research and development, the placing of employees with other firms, development of cost management systems across firms, collaborative inventory control and inventory placement decisions (Liang et al., 2011). SCM has an emphasis that goes well beyond the traditional function of materials management. Information sharing between the buyer and supplier is considered to be a major indicator of the use of SCM. When information flows seamlessly in both directions, the effect is to create a virtual supply chain. Information transfer is used, in effect, to integrate the entire value chain into one longer chain (Yang et al., 2012).

EDI is important since it facilitates frequent and automatic transfers of information required for high degrees of integration and coordination within the supply chain. Conversely, the use of EDI, without the integration of supply chain activities, will simply speed up an existing process. This integration requires the reorganization and restructuring of the relationships between firms to achieve the full benefit from use of both EDI and SCM. Coordination is an integral part of supply chain integration. Mwai, Kiplang'at and Gichoya (2014) focus their research on the coordination between firms, using it to measure integration. In particular, EDI is an enabling factor and the first step leading to integrated supply chains. Magutu (2010) show that the degree of integration in SCM depends on the degree of EDI use within the firm.

Many organizations are applying Electronic Data Interchange (EDI) to improve operational efficiency, enhance information quality, and achieve reductions in processing time of critically important business information. EDI today represents an opportunity to improve business processes and business controls directly even though challenges are expected (Seggie, 2012). Successful implementation and application of EDI offers numerous benefits. According to Tumaini (2011), benefits of EDI include the ability to improve certain business services significantly, increase in productivity and enabling faster and more efficient information exchange with trading partners. Application of EDI also leads to reduced lead-time from placing the order to receiving the goods for manufacturing and retail firms, reduces errors associated with manual documents and data entry, greater sharing of information and greater tracking of market data.

E-tendering

According to Nurmandi and Kim (2015), e-tendering is the use of internet to operate the transactional aspects of requisitioning, authorizing, ordering, receiving and payment process for the required services and products. Ribarsky (2013) also defines e-tendering as the electronic integration and management of all procurement activities including purchase request, authorization, ordering delivery and payment, between a purchaser and a supplier. E-tendering system is a probable means in reducing operation costs allowing wider choice of products, deducting manual order processing costs and administrative costs. E-tendering is an electronic system used to automate all or part of the procurement function by enabling the scanning, storage and retrieval of invoices and other documents, management of approvals; routing of

authorization requests; interfaces to other finance systems and matching of documents to validate transactions. E-tendering is not just about reducing the operational costs of an organization; but more about promoting the well-being of the employees and the enterprise as a whole through organizational efficiency (Nurmandi & Kim, 2015).

The adoption of web-based e-tendering systems purchasing transactions allows firms to reduce transaction costs, improve internal process efficiency and increase collaboration with suppliers. The benefits of technology-based supports for procurement activities can be organized into two broad categories: Organizational level and Inter-organizational level. In organizational levels, previous studies suggested that implementing e-procurement systems could make companies procurement process more efficient and effective through automating procurement process, re-engineering the internal process and enhancing inter organizational co-ordination. Ojha and Pandey (2014) noted that by implementing e-tendering, the firm could shorten order fulfillment cycle time, lower inventory levels, and the price paid for goods, and reduces administrative costs of procurement. Auramo *et al.* (2012) argued that the benefits of e-tendering can be classified into hard benefits (such as price savings and process cost reductions), soft benefits (such as individual time freed up through more efficient processes), and intangible benefits (such as cultural change, financial approval for all spending, and high visibility of supplier performance). Moharana *et al.* (2013) found out that e-tendering systems can bring benefits to the company such as reducing time to market cycles, reducing material and transactions costs, and reducing stock levels.

Supply Chain Integration

According to Nurmandi and Kim (2015) supply chain integration as partnership-based coordination links a firm with its customer, supplier, and other channel members by integrating their relationships, activities, functions, process, and locations. Backward and forward integration are strategic initiatives companies may perform to reduce risks and interdependencies with external business partners in the supply chain (Ojha & Pandey, 2014). Fundamentally, companies may increase their control over a wider scope of the supply chain by performing backward or forward integration and increase their own decision-making power over key resources and competencies important to the competitiveness of the organization. The purpose of the integrated supply chain is to create easiness in terms of information, material as well as cash flows (Alam *et al.*, 2014). The ever increasing depth, size and complexity of the global market put more emphasis in links and collaborations between supply chain parties in order to improve coordination and manufacturing sustainability. The aim of integration within the supply chain is to ensure commitment to cost and quality, as well as achieving minimum distortion to plans, schedules and regular delivery of small volumes of orders (Yang *et al.*, 2012). Many firms wish to achieve the benefits of both responsiveness and low cost. The opportunity to use process integration across functional boundaries is now considered a key to competitive success. Taghva *et al.* (2012) argued that supply chain integration is a key to obtain competitive advantage in the current e-global environment. Effective integration of suppliers into product value/supply chains will be a key factor for some manufacturers in achieving the improvements necessary to remain competitive.

Enterprise Resource Planning (ERP)

Implementation of enterprise resource planning (ERP) information systems has been the common choice for organizations to integrate enterprise-wide processes. ERPs have been advertised as an application that improves business processes and develops visibility across the organization. However, there is concern about the effectiveness of ERP capabilities in improving supply chain processes (Tumaini, 2011). ERP systems attempt to reduce costs and increase efficiencies by integrating business processes and improving information access across an organization. Similarly, effective supply chain management aims to increase margin by sharing information inter-organizationally (Xuan et al., 2011). ERP systems have the ability to improve information exchange but are traditionally intended to manage information within a single organization. Since supply chain management (SCM) consists of multiple organizations needing to work together as one entity, some would argue that ERP systems are insufficient for modern SCM. One reason for the challenge is the lack of trust between organizations. The multiple relationships within supply chain management to deliver supplies to manufacturers and deliver products to customers takes a substantial level of trust (Ifinedo et al., 2010).

Trust can be a significant challenge in any ERP implementation. Successful supply chain integration and long-term performance not only requires trust between parties in one organization but between supply chain partners in multiple organizations (Zhu et al., 2012). Sharing information between organizations and supply chain partners through ERPs not only requires trust but a high level of commitment between all parties involved. ERP systems impose standardized business practices that may conflict with existing supply chain processes. Research has found that ERP systems provide little improvement to the supply chain and often introduce new supply chain management issues (Ifinedo et al., 2012).

Research Methodology

This study used a descriptive survey design. The study used both quantitative and qualitative techniques. The target population for this study was all the 159 staff from the seven directorate of the judiciary of Kenya. The study was focusing on the key employees who understand the role supply chain performance and what it entails. This study used a census survey to get all 159 employees working at the headquarter judiciary in Kenya. There are two types of data: primary data and secondary data. This study made use of primary data. The study used structured and semi-structured questionnaires to collect the primary data. The structured questions was used in an effort to conserve time and money as well as to facilitate an easier analysis as they are in immediate usable form; while the unstructured questions was used as they encourage the respondent to give an in-depth and felt response without feeling held back in revealing of any information.

The data that was checked for correct entries, coded and entered into the computer through Statistical Package for Social Science (SPSS) version 21. The data analysis was both qualitative and quantitative, because they enforce each other. The presentation of data constituted the measures of central tendency including the mean and variance, ANOVA and correlation analysis to determine the strength in relationship between the variables under study. The findings of this

study were presented in form of pie charts, graphs, tables and figures. Multiple regression model was applied in this study as follows:

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

Where:

Y=Dependent variable (supply chain performance)

β_0 - is to the constant

β_1 . is Electronic Data Interchange

β_2 . is E-Tendering

β_3 . is Supply Chain Integration

β_4 . is Enterprise Resource Planning

ϵ - is the error

Research Findings and Discussion

The target population of this study was all the 159 staff from the seven directorates of the judiciary of Kenya. Out of 159 staff, 130 responses were obtained. This gives a response rate of 81.76%. A 100% response rate was not achieved as some of the questionnaires had some inconsistent information and some were half way filled and thus could not be used in the study. According to Greener (2008), a response rate of 50% or more is adequate for analysis, which shows that 81.76% was an acceptable basis for drawing a conclusion.

Effect of Electronic Data Interchange in Supply Chain Performance

The first objective of this study was to determine the role of electronic data interchange in supply chain performance in public institutions in Kenya. From the findings, the respondents indicated that they used direct communication of structured business information in their organization to a great extent (M=4.053) and they used automatic transfer of information to a great extent as shown by a mean of 4.0154. Further, the respondents indicated that they used automated order processing and real-time visibility into transaction status to a great extent as indicated by means of 3.9846 and 3.9769, respectively. The respondents further indicated that they used automated order processing in their organization to a great extent as indicated by a mean of 3.9615.

Table 1: Usage of Electronic Data Interchange in Supply Chain

	Mean	Std. Deviation
Automatic transfer of information	4.015	0.797
Automated order processing	3.961	0.810
Real-time visibility into transaction status	3.976	0.751
Direct communication of structured business information	4.053	0.856

Effect of E-Tendering in Supply Chain Performance

The second objective of this study was to establish the role of e-tendering in supply chain performance in public institutions in Kenya. According to the findings, the respondents indicated that their organization used e-evaluation element of e-tendering in its supply chain to a great extent as indicated by a mean of 4.046. The respondents also indicated that the organization was

using e-bidding in its supply chain to a great extent (4.000). Further, the respondents indicated that the organization was using e-sourcing in its supply chain to a great extent as shown by a mean of 3.969. Also, the respondents indicated with a mean of 3.961 that the organization was using electronic authorization and e-payment in to a great extent.

Table 2: Usage of E-Tendering in Its Supply Chain

	Mean	Std. Deviation
E-sourcing	3.969	0.806
E-bidding	4.000	0.736
Electronic authorization	3.961	0.751
E-payment	3.961	0.781
E-evaluation	4.046	0.8520

Effect of Supply Chain Integration in Supply Chain Performance

The third objective of the study was to find out the role of supply chain integration in supply chain performance in public institutions in Kenya. According to the findings, the respondents indicated that the organization was using information sharing in its supply chain to a great extent as indicated by a mean of 4.069. The respondents also indicated with a mean of 4.061 that the organization was using e-briefing/debriefing in its supply chain to a great extent. In addition, the respondents indicated with a mean of 4.030 that the organization used corporate responsibility with stake-holders to a great extent. Further, the respondents indicated they used customer and supplier integration as well as organization coordination in their organizations to a great extent as indicated by means of 3.961 and 3.969 respectively.

Table 3: Usage of Supply Chain Integration

	Mean	Std. Deviation
Information Sharing	4.000	0.681
Buyer-seller relationship	4.069	0.661
Organization Coordination	3.969	0.714
Customer and supplier integration	3.961	0.761
e-Briefing/Debriefing	4.061	0.765
Corporate Responsibility with stake-holders	4.030	0.714

Effect of Enterprise Resource Planning in Supply Chain Performance

The fourth objective of the study was to assess the role of enterprise resource planning in supply chain performance in public institutions in Kenya. According to the findings, the respondents indicated that they used budgeting in supply chain to a great extent as shown by a mean of 4.192. The respondents also indicated with a mean of 4.169 that their organization used shipping of products in its supply chain to a great extent. The respondents further indicated with a mean of 4.138 that their organization used warehousing to a great extent. In addition, the respondents indicated they used material flow and the flow information in their organizations to a great extent as indicated by means of 4.046 and 4.123, respectively.

Table 4: Usage of Enterprise Resource Planning in Its Supply Chain

	Mean	Std. Deviation
Budgeting	4.192	0.727
Shipping of products	4.169	0.716
Warehousing	4.138	0.775
Material flow	4.046	0.852
The flow Information	4.123	0.715

Supply Chain Performance

The respondents were asked to indicate the rating of measures of supply chain performance in their organization. From the findings, the respondents rated timely delivery of supply chain performance in their organization as good (M=4.092). In addition, efficiency in service delivery was rated as good (M=4.046). Further, the respondents rated cost minimization as good (M=4.030) and high performance as good (M=4.030). Also, the respondents rated customer satisfaction and performance so far as good (M=4.000).

Table 5: Measures of Supply Chain Performance

	Mean	Std. Deviation
Timely delivery	4.092	0.782
Efficiency in service delivery	4.046	0.766
Cost minimization	4.038	0.829
Customer satisfaction	4.000	0.853
There are high performance	4.030	0.786
The rate of performance so far	4.000	0.806

Correlation Analysis

The study used Pearson correlation analysis to establish whether the independent variables had any influence on the dependent variable. The results indicate that there is a positive association between electronic data interchange and supply chain performance in public institutions ($r=0.976$). The relationship was significant because the p-value (0.000) was less than the significance level (0.05). In addition, the results indicated that e-tendering is positively correlated with supply chain performance in public institutions ($r=0.979$). The association was significant because the p-value (0.000) is less than the significance level (0.000). The results also show that supply chain integration is positively associated with supply chain performance in public institutions ($r=0.942$). The association was significant as the p-value (0.000) was less than the significance level (0.05). Further, the results show that enterprise resource planning is positively associated with supply chain performance in public institutions ($r=0.969$). The association was significant because the p-value (0.000) was less than the significance level (0.05).

Table 6: Correlation Analysis

		Supply Chain Performance	Electronic Data Interchange	E-Tendering	Supply Chain Integration	Enterprise Resource Planning
Supply Chain Performance	Pearson Correlation Sig. (2-tailed)	1				
Electronic Data Interchange	Pearson Correlation Sig. (2-tailed)	.976** .000	1			
E-Tendering	Pearson Correlation Sig. (2-tailed)	.979** .000	.342 .210	1		
Supply Chain Integration	Pearson Correlation Sig. (2-tailed)	.942** .000	.324 .220	.324 .220	1	
Enterprise Resource Planning	Pearson Correlation Sig. (2-tailed)	.969** .000	.229 .320	.109 .398	.342 .210	1

Regression Analysis

A multivariate regression analysis was also carried out to determine the relationship between dependent variable and the four independent variables. The R-Squared is the proportion of variance in the dependent variable which can be explained by the independent variables. From the findings, the R-squared in this study was 0.983, which shows that the four independent variables (electronic data interchange, e-tendering, supply chain integration and enterprise resource planning) can explain 76.03% of the variation in the dependent variable. This clearly shows that other factors not considered in this study explain 23.97% of the variation in the dependent variable, performance of supply chain management.

Table 71: Model Summary

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	0.872	0.7603	0.7562		0.10238

From the findings, the analysis of variance in this study was used to determine whether the model is a good fit for the data. The results indicate that the model was significant since the p-value (0.000) was less than 0.05 thus the model is statistically significance in establishing the effect of electronic data interchange, e-tendering, supply chain integration and enterprise resource planning on the performance of supply chain. Further, the F-calculated (1844.541) was

found to be more than the F-critical (2.4472) which shows that the models was fit in establishing the influence of the four independent variables on the dependent variable.

Table 8: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	77.340	4	19.335	1844.541	.000 ^b
	Residual	1.310	125	.010		
	Total	78.650	129			

The regression model was;

$$Y = -0.258 + 0.290X_1 + 0.263X_2 + 0.102X_3 + 0.404X_4 + \varepsilon$$

From table 4.17, the findings show that there is a positive significant relationship between electronic data interchange and supply chain performance with a regression coefficient of 0.290. This shows that a unit increase in electronic data interchange would lead to a 0.290 improvement in supply chain performance in the Judiciary of Kenya. The p-value (0.005) was less than the significance level (0.05), hence the relationship was significant. The results also show that there is a positive significant relationship between e-tendering and supply chain performance in the Judiciary of Kenya with a regression coefficient of 0.263. This shows that a unit increase in e-tendering would lead to a 0.263 improvement in the supply chain performance in the Judiciary of Kenya. The relationship was significant as the p-value (0.022) was less than the significance level (0.05).

From the findings, the study found that there is a positive relationship between supply chain integration and supply chain performance in the Judiciary of Kenya with a regression coefficient of 0.102. This indicates that a unit increase in supply chain integration would lead to a 0.102 improvement in the supply chain performance in the Judiciary of Kenya. The relationship was found to be significant as the p-value (0.017) was less than the significance level (0.05). Lastly, the study results show that there is a positive significant relationship between enterprise resource planning and supply chain performance in the Judiciary of Kenya as shown by a regression coefficient of 0.404. This indicates that a unit improvement of enterprise resource planning would lead to a 0.404 improvement in supply chain performance in the Judiciary of Kenya. This relationship was significant as the p-value (0.000) was less than that of the significance level (0.05). These findings infer that enterprise resource planning influence the supply chain performance in the Judiciary of Kenya most, followed by electronic data interchange, electronic tendering and supply chain integration.

Table 9: Regression Coefficients

		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
(Constant)		0.258	0.055		4.726	0.000
Electronic Interchange	Data	0.290	0.101	0.289	2.870	0.005
E-Tendering		0.263	0.113	0.256	2.325	0.022
Supply Integration	Chain	0.102	0.042	0.089	2.417	0.017
Enterprise Planning	Resource	0.404	0.040	0.379	10.029	0.000

Conclusion

The study also concludes that electronic data interchange has a positive and significant influence on supply chain performance in the Judiciary of Kenya. The study found that the organization was using automatic transfer of information, automated order processing, automated order processing, real-time visibility into transaction status and direct communication of structured business information in its supply chain. The study also concludes that electronic tendering has a positive and significant influence on supply chain performance in the Judiciary of Kenya. The study established that the organization was using e-sourcing, e-bidding, electronic authorization, e-payment and e-evaluation in its supply chain. The study also concludes that supply chain integration has a positive and significant influence on supply chain performance in the Judiciary of Kenya. The study established that the organization was using information sharing, buyer-seller relationship, organization coordination, customer and supplier integration, e-briefing and corporate responsibility with stake-holders. Lastly, the study concludes that enterprise resource planning has a positive and significant influence on supply chain performance in the Judiciary of Kenya. The study found that the Judiciary of Kenya was using elements of enterprise resource planning such as budgeting, shipping of products, warehousing, material flow and the flow information.

Recommendations

The study found out that electronic data interchange influences supply chain performance in public institutions in Kenya. The study therefore recommends that the Judiciary of Kenya should involve the use of supply chain integration and joint decision making as a way of enhancing supply chain performance in public institutions.

The study also found that e-tendering influences supply chain performance in public institutions in Kenya. Hence, the study recommends that organizations should automate their systems so as to improve supply chain performance in public institutions

Further, the study revealed that that supply chain integration influences supply chain performance in public institutions in Kenya. The study therefore recommends that organizations should integrate their systems as a way of gaining competitive advantage and risk reduction.

The study revealed that enterprise resource planning influences supply chain performance in public institutions in Kenya. The study therefore recommends that organizations should integrate the internal and external management information across all departments, facilitate the flow of information between all business functions as a way of enhancing its chain performance.

Area for Further Studies

This study is a milestone for future research in this area, particularly in role of information technology on supply chain performance in public institutions in Kenya. The findings emphasize the importance of the components of IT towards the performance supply chain in the public sector, which comprises ERP, e-tendering, supply chain integration and EDI. From the fact that the study was a case study of a single organization and therefore cannot be used to generalize the entire IT in the public institutions. The factors under study only explained 76.03% of the supply chain management in Kenya. This therefore calls for the need to carry out further research particularly on other factors affecting supply chain performance in the Judiciary of Kenya.

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