

## **E-ORDERING AND E-INFORMING ON SUPPLY CHAIN PERFORMANCE IN KENYAN STATE CORPORATIONS IN NAIROBI COUNTY**

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### **Abstract**

*The study purpose is to determine the effect of E-ordering and E-informing on supply chain performance. The study was informed Innovation Diffusion Theory. Explanatory research design was used in the undertaking of this research. Using 262 procurement officers from 112 Kenyan State Corporations, multiple regression model findings showed that e-ordering and e-informing has a positive and significant effect on supply chain performance. The study concludes that e-ordering and e-informing which are elements of e-procurement dimensions increases supply chain performance. There is therefore need for firms to make use of e-ordering and e-informing in the procurement process. There is also need to electronically consult references for product/service quality so as to heighten supply chain performance.*

*Keywords: E-procurement, E-ordering, E-informing, Supply Chain Performance, Kenya*

### **INTRODUCTION**

Supply chain management (SCM) is an important way of attaining competitive advantage and enhancing performance of organization. In this regard most organizations have embraced ICT to enhance the supply performance. Embracement of electronic procurement has greatly simplified/ made the business purchasing operation easy and real. By accommodating e-procurement in an organization the entire process especially purchasing leads to reduced cost of doing business.

E Procurement is a key component of e-business and e-commerce (Vaidya et al., 2004; World Bank, 2003; Murray, 2001), e-Procurement is basically a tool that enables procurement activities such as sourcing, ordering, commissioning, receipting and making payment. The e-procurement value chain consists of indent management, e-Tendering, e-Auctioning, vendor management, catalogue management, Purchase Order Integration, Order Status, Ship Notice, e-Invoicing, e-Payment, and contract management. However, Tonkin (2003) argues there was little history of extensive use of e-Procurement in the public sector and, therefore, the academic literature covering early public sector adoption of e-Procurement is limited.

Manual procurement system has been in use not only in the private sector but also in the government state corporations. Public procurement is an important function of government (Thai, 2001). Instead of satisfying requirements for goods, works, systems, and services in a timely manner (Vaidya *et al.*, 2006), the Kenya procurement system had proved to be long, cumbersome and time consuming. This procurement system had several deficiencies that contributed to huge losses in public funds (Mose, 2012). It has also proved to be costly for both buyer and supplier or organizations, besides being regarded as a perpetrator of corruption. However, (Wittig, 2003; Callender & Schapper, 2003) noted that a good procurement system has to meet the basic principles of good governance: transparency, accountability, and integrity. With these in mind, the government in conjunction with other stakeholders decided to introduce e-procurement in state corporations.

It was realized that the Procurement personnel were not adequately trained and there was also lack of professionalism amongst them, and there was no professional body to oversee and install discipline among procurement officers (Mose, 2012). It was in view of all these shortcomings that the Kenya government in conjunction with other stakeholders like the International Trade Centre, World Bank and the Africa Development Bank, thought of looking for a way to eliminate the deficiencies by initiating the procurement reform process. As Mose (2012) notes, the reform process was meant to create a system that allowed proper delegation of authority, procurement threshold, planning and development of supplies manual. The primary focus was to address the issue of procurement laws, establish appropriate procurement Institutions and entities, and create adequate and timely monitoring and evaluation mechanism. This marked the birth of Public Procurement Regulation (2001) and later the Public Procurement and Disposal Act (2005).

Before the introduction of Public Procurement and Disposal Act (2005), the government of Kenya through the Financial Regulations of 1970, gave the Ministry of finance the overall responsibility of regulating the procurement of goods, works and services (Mose, 2012). Mose further argues that the Ministry of finance communicated all procurement issues to government

departments through circulars. Later the government realized that this procurement system had several deficiencies that contributed to huge losses in public funds. The procurement system was noted to lack transparency, accountability and fair competition. Therefore this study intended to determine how the two dimensions of E procurement namely E-ordering and E-Informing on supply chain performance. The paper hypothesized that

$H_{o3}$ : *E-ordering has no significant effect on supply chain performance*

$H_{o4}$ : *E-informing has no significant effect on supply chain performance*

## THEORETICAL FRAMEWORK

The Innovation diffusion theory (Rodgers, 1995) is a model grounded in business study. Since 1940's the social scientists coined the terms diffusion and diffusion theory (Dean, 2004). This theory provides a framework with which it can make predictions for the time period that is necessary for a technology to be accepted. Constructs are the characteristics of the new technology, the communication networks and the characteristics of the adopters. Innovation diffusion can be seen as a set of four basic elements: the innovation, the time, the communication process and the social system. Here, the concept of a new idea is passed from one member of a social system to another. Clemons, (1992) redefined a number of constructs for use to examine individual technology acceptance such as relative advantage, ease of use, image, compatibility and results demonstrability. The advantage of the improved system is that it has allowed for better communication between the supplier and the buyer since they have to communicate to ensure that less time is taken to realize value on the supply chain management.

## EMPIRICAL REVIEWS

### E-Ordering on Supply Chain Performance

Kim, (2002) argues that E-ordering 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-ordering, the goods and services ordered are indirect goods and services i.e., non-product related goods and services. The supporting software system an ordering catalogue system is usually used by all employees of an organization. In case of Enterprise Resources Planning (ERP) the goods and services ordered are product related. It may be noted that ordering of direct goods and services usually is plan-based. EDI electronic ordering is ideal for customers wishing to develop an automated purchasing system for orders. By eradicating repetitive manual processes and removing the need for paperwork, EDI

electronic ordering solution enables the business to reduce costs, increase productivity and improve customer service thus improved supply chain performance (Bello, 2002). Petersen, (2005) 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. People can place orders from their home as long as they have a computer/laptop with Internet connection thus improved supply chain performance.

Electronic controlled substance orders are placed using a software program that has been approved for Controlled Substance Order System (CSOS). Typically, this software is available through a wholesaler and may be implemented into their ordering Web site. This software includes functionality to digitally sign the purchase order using the purchaser's CSOS digital certificate issued by DEA. A CSOS Certificate may be installed into multiple software programs and may also be transferred to multiple ordering computers (Sanders, 2004). Sales and Purchase ordering appears to be a straightforward process but is in fact a major challenge for buyers and suppliers. Relying on paper, fax, email and phone based ordering means that there is a dependency on manual intervention which in itself can be slow but is proven to be liable to rekeying errors hence could increase the performance of the supply chain (Foster, 2002).

### **E-Informing on Supply Chain Performance**

Stonebraker, (2006) in his study argues that E-informing is a form of Enterprise Resource Planning (ERP) that is not directly associated with a phase in the purchasing process like contracting or ordering. E-informing is the process of gathering and distributing purchasing information both from and to internal and external parties, using the internet technology. Li *et al.*, (2005) mentioned that information sharing refers to the extent to which critical and proprietary information is communicated to one's supply chain partner thus more efficiency and high performance of the supply chain. Information sharing does not only share information with partners, but also provides adequate, timely and accurate information. In other words, information sharing should include the concept of information quality. Information quality includes such aspects as the accuracy, timeliness, adequacy, and credibility of information exchanged.

Information sharing includes both formal and informal information sharing with partners. And the information must ensure the quality with accuracy, timeliness, adequacy, credibility, and criticality thus more noticeable supply chain performance (Croom, 2003). Ensuring the quality of shared information has become a critical issue of effective Supply Chain Management (Cagiano

*et al.*, 2003), supported that internet or internet tool can facilitate information sharing and more collaboratively with their partners. E-procurement is a kind of internet tool in their article. Eng (2004) also said that e-marketplace provides a shared internet-based infrastructure that enables participant organizations to communicate with one another effortlessly.

Information sharing is about the information flow, the timeliness of information availability, and the openness and transparency. It will affect performance apparently. For instance, the e-marketplace provides a mechanism for companies to control, coordinate, and economize on transaction costs, as it improves information flows and helps reduce uncertainty (Eng, 2004). The use of IT enables far greater information to be more widely distributed, and in terms of the ability to offer access to large catalogues of suppliers, the range of products and services available to employees is reported to have provided far greater range flexibility (Evans & Wruster, 2001).

## RESEARCH METHODOLOGY

The study adopted Explanatory research design. A census was utilized to select the target respondents for the study. Questionnaires were used to collect data from 244 employees who were directly involved in the procurement practices in the Kenyan State Corporations.

Quantitative data was analyzed using descriptive statistical method; the statistical tools such as mean, mode and standard deviation were used. Inferential statistic such as Pearson correlation coefficients  $r$  and multiple regression models were used. Multiple regression analysis was employed to test the hypotheses.

Regression equation was a function of variables  $x$  and  $\beta$

$$y = \alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \varepsilon$$

Where  $\alpha$  was the intercept

$\beta_1 \dots \beta_4$  are regressions coefficients

$X_1$  = E-tendering

$X_2$  = E-sourcing

$Y$  = Supply Chain Performance.

$\varepsilon$  = Error Term

Reliability assessment of internal consistency of the items was determined using Cronbach alpha coefficient. According to (Sekeran, 2003; Ventura *et al.*, 2013; Waithaka *et al.*, 2014; Cooper & Schindler, 2001), the general reliability coefficients around 0.9, was considered excellent, values around 0.8 as very good and values around 0.7 as adequate (Nunnally, 1978).

Table 1. Summary of Measurement Instruments

Variables	Indicators	Cronbach's Alpha	Adopted from
Supply chain performance	<ul style="list-style-type: none"> <li>• Handle difficult nonstandard order</li> <li>• meet special customer specification</li> <li>• introduction of new product/service</li> <li>• present high quality levels</li> <li>• present high service levels</li> <li>• correct quantity of product</li> <li>• respond quickly to our petition</li> <li>• have low price/cost of product/service</li> <li>• flexibility</li> <li>• orders on time</li> <li>• deliver cycle time</li> <li>• customer response rate</li> <li>• adjust product /services to meet changing need</li> <li>• deliver product/service on-time</li> </ul>	0.911	(Quesada <i>et al.</i> , 2010)
E-ordering	<ul style="list-style-type: none"> <li>• electronically purchase for our product and services</li> <li>• conduct online order requisitions</li> <li>• electronically process suppliers invoice</li> <li>• electronically process payment to our supplier</li> <li>• electronically purchase approval are done</li> <li>• electronically order for receipt for payment</li> </ul>	0.821	Harink, 2003; Reunis, Santema & Harink, 2006)
E- informing	<ul style="list-style-type: none"> <li>• electronically gather information for suppliers experiences</li> <li>• electronically gather information on supplier previous clientele</li> <li>• electronically consult references for product/service quality</li> <li>• electronically distribute our information to the relevant suppliers</li> <li>• electronically distribute information about pricing, and any other information online</li> </ul>	0.747	Boer, Harink & Heijboer, 2001; De Boer, Harink & Heijboer, 2002; Essig & Arnold, 2001

## EMPIRICAL FINDINGS

### Descriptive statistics

This section of the analysis focused on the supply chain performance of Kenyan State Corporations. As evidenced in table 1, all the means were above 3.5 indicating all respondents agreed on the elements of supply chain performance. Hence, there was high supply chain performance.

Table 2. Supply chain performance

	Mean	Std. Deviation
We are able to Handle difficult nonstandard order	4.07	0.64
We are able to meet special customer specification	4.33	0.56
We handle rapid introduction of new product/service	3.73	0.77
Our suppliers present high quality levels	4.22	0.52
Our suppliers present high service levels	4.21	0.54
Our suppliers deliver product/service on-time	4.3	0.64
Our suppliers respond quickly to our petition	4.12	0.65
Our suppliers have low price/cost of product/service	4.02	0.98
Our suppliers have enough flexibility to respond to unexpected demand changes	4.07	0.97
Our suppliers deliver the correct quantity of product	4.59	0.53
Our suppliers are willing to adjust product /services to meet changing need	4.4	0.65
Our firm fills customer's orders on time	4.61	0.54
Our firm has short order to deliver cycle time	3.94	0.77
Our firm has fast customer response rate	4.39	0.52
Supply chain performance	4.21	0.46

### E-ordering

The first research objective focused on the effect of E-ordering on supply chain performance. The findings were illustrated in table 3 a low mean for E ordering indicating that E-ordering was not adequately practiced in state corporations

Table 3. E-ordering

	Mean	Std. Deviation
We electronically purchase for our product and services	3.45	0.86
We electronically order for receipt for payment of goods and services supplied	3.52	0.97
We electronically process suppliers invoice	3.38	1.08
We electronically process payment to our supplier	3.78	1.07
electronically purchase approval are done	3.5	1.16
We conduct online order requisitions	3.21	0.98
E-ordering	3.47	0.74

## E- Informing

The second research objective was set to determine the effect of E-informing on supply chain performance. Table 4 illustrates E-informing had a mean of 3.7 and a standard deviation of 0.55 which shows that informing was moderately practiced in state corporations.

Table 4. E- informing

	Mean	Std. Deviation
We electronically gather information for suppliers experiences	3.79	0.73
We electronically gather information on supplier previous clientele	3.78	0.73
We electronically consult references for product/service quality	3.84	0.67
We electronically distribute our information to the relevant suppliers	3.79	0.71
We electronically distribute information about pricing, and any other information online	3.32	1.02
E-informing	3.7	0.55

## Correlation Results

Pearson's product moment correlation analysis was used to assess the correlation between the variables. E-informing and supply chain performance ( $r = 0.697$ ,  $p < 0.01$ ) and E-ordering and supply chain performance ( $r = 0.610$ ,  $p < 0.01$ ).

Table 5. Correlation Results

	Supply chain performance	E ordering	E informing
Supply chain performance	1		
E ordering	.610**	1	
E informing	.697**	.672**	1

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

## Hypothesis Testing

E-ordering showed a positive and significant effect on supply chain performance. Cognate to the results, Kim, (2002) argues that E-ordering greatly improves the supply chain performance since the placing of purchasing orders as well as receiving goods and services ordered is made possible by the use of internet technology. Concurrently, Bello, (2002) argues that, EDI electronic ordering eradicates repetitive manual processes and removes the need for paperwork leading to increased productivity and improved customer service thus improving supply chain performance. Further support to the study is by Petersen, (2005) who asserts that online



ordering allows customers to order products or services via their website thus improving supply chain performance.

E-informing was found to have a positive and significant effect on supply chain performance. Therefore, the use of internet technology to gather and distribute purchasing information results to improved supply chain performance. In conformity with the findings of the study, Li *et al.*, (2005) echoed that information sharing facilitates relay of critical and proprietary information to one's supply chain partner hence contributing to high performance of the supply chain. Similarly, Croom, (2003) opines that E-informing ensures quality with accuracy, timeliness, adequacy, credibility, and criticality thus more noticeable supply chain performance. In line with the findings of the study, a study by Presutti (2003) found out that real-time exchange of information in the e-design stage reduces time-to-market thus improving supply chain performance.

Table 6. Coefficient of Estimate

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	1.725	0.156		11.029	0.000		
E ordering	0.603	0.071	0.969	8.486	0.000	0.138	7.258
E informing	0.213	0.061	0.255	3.502	0.001	0.34	2.940
R <sup>2</sup>	0.621						
Adjusted R <sup>2</sup>	0.613						
Change in R	0.788						
F	86.263**						

a) Dependent Variable: supply chain performance

## CONCLUSIONS AND RECOMMENDATIONS

The study found E-ordering was shown to contribute immensely to supply chain performance. It is evident that e-ordering electronically purchase for products and services, order for receipt for payment of goods and services supplied, process suppliers invoice, process payment to the supplier, purchase approval are done and conduct online order requisitions. It also increases productivity and improves customer service since products and services can be purchased electronically. As a result, there is reduced dependency on manual intervention since the online ordering system caters for the supply chain functions.

Finally, E-informing contributed positively to supply chain performance. This is because e-informing electronically gather information for suppliers experiences, gather information on supplier previous clientele, consult references for product/service quality, distribution of information to the relevant suppliers and distribute information about pricing, and any other

information online. Also, information is gathered for suppliers' experiences and their previous clientele. Additionally, information about pricing is available online. In so doing, supply chain performance is enhanced.

Moreover, there is need for firms to implement the use of e- ordering in supply chain so as to reduce on paper work and also save on cost. E-ordering also provides an avenue for improved customer service and increased productivity hence the need for its implementation by firms. Finally, since e-informing has a positive influence on supply chain performance, it is imperative for firms to gather information for suppliers experiences, previous clientele as well as distributing information to the relevant suppliers. There is also need to electronically consult references for product/service quality so as to heighten supply chain performance.

In addition, including moderator factors and looking forward to direct or indirect relationship towards supply chain performance can also be made in the research models of the new research by other scholars in future. A similar study also has to be conducted in another County so as to come up with a conclusive picture. Given these considerations, there will be conclusive results on the effect of e-procurement on supply chain performance.

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