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Integrating Electronic Information Sharing in Supply Chain for Organization Performance of Parastatals in Nakuru County, Kenya

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Abstract:

In this Information Age, the world is an informational hub where information is available everywhere almost instantaneously and the supply chain benefits greatly from the flow of it. The main aim of the study was to investigate the magnitude of parastatals integration of their systems to enable them to share and acquire information about their suppliers electronically to promote organizational performance. The study focused on the integration of e-information sharing through, virtual administered questionnaires, e-catalogues accessibility, real-time information access, e-referencing and e-referrals and online access to suppliers' capabilities. The study used a population of 236 where purposive sampling was adopted and a population of 91 respondents was selected to attain findings. Questionnaires were used as the main instrument to collect data out of which 80 respondents gave their responses. The study used a null hypothesis to test the rate of the relationship of the variable to organization performance. The study confirmed there was a statistical significance between e-information sharing and organization performance. The study recommends that parastatals enhance system integration and education with their suppliers to provide compatibility and easy access and flow of information.

Keywords: e-information sharing, e-catalogues, virtual questionnaires, supply chain, e-referencing, organization performance

1. Introduction

Information is the very essence of life for any organization. Its flow or stream enables companies, to keep abreast with its competitors, new technology, government and international issues that may affect the business. Suppliers sharing their information enable them to understand their clients better and offer solutions that best meet their specifications. When companies and suppliers share information willingly, accurately and truthfully, it assists companies to easily evaluate their suppliers by checking on their capabilities and areas they are lacking and improve on them. When information is shared suppliers become part of the organization and relationships are fostered to become alliances instead of adversaries. It becomes easier to negotiate on prices and other terms of services that are mutually beneficial to both parties.

E-information Sharing constitutes the virtual dissemination of important data for structures, people and departments in the organization. The advancement into Information Technology has enabled the electronic exchange of information which has initiated the increased flow of information which reduces uncertainty (Lotfi et al, 2013). Supply chain is one of the areas of business whose coordination and performance depend solely on the information it acquires from its suppliers to enable them to acquire quality goods to meet customer expectations and satisfaction and improve the organization.

Proper and elaborate information sharing increases the chances of forecasting the flow of goods and consequently improves delivery of goods and enhances the relationships with the members of the supply chain (Oteki, 2018). Information sharing leads to improved efficiency in terms of service delivery. Some of this shared information includes pricing and technical information exchange while the least being online viewing of supplier catalogues (Akoth, 2017). Information sharing from an electronic viewpoint requires both firms to have a well-integrated ICT system, to enable both parties to access information, (Harelimana, 2018). The use of Blockchain technologies in information sharing has also assisted in improving storage by refining information accessibility and automating information within the supply chain.

(Mung'asio and Moronge, 2019). It grants parties to share similar documentation instead of copies and the information can only be updated through unanimity across the system of participants. Virtual distribution of information requires complete disclosure from both parties to ascertain that the information being disseminated is accurate and UpToDate. (Luther and Olson, 2013).

Organizational Performance is measuring the actual results of a firm against the anticipated or objectives of the organization, it is also a comparison between the output and the organization's projected output (Richard et al., 2009, Almatrooshi, et al, 2016). It consists of three areas, (i) financial accomplishment -profits and returns on investment and product (ii) market operation -market share and sales and (iii) shareholder return (Richard et al., 2009). Determining organizational performance is a crucial aspect in determining the development of the organization (Felizardo, 2017). It embodies the aptitude of the organisation to meet its responsibilities through proper management, good governance, consistent dedication to meeting the results put forward, (Kilonzo, 2014). It is measured based on the firm's ability to increase productivity, reduce inventory and strengthen its market share (Kipkemoi, 2017).

1.1. Research Problem

The prospect of virtual distribution of information among suppliers and institutions is magnanimous for the performance of the supply chain, suppliers and the organization in general. Lack of well stream information brings shortcomings of disorganization, inefficiency in coordination. Knowledge needs to flow both upstream and downstream (Zhou and Benton, 2007). This information includes suppliers' capabilities, challenges, orders, sales forecast or inventory information. However, some suppliers and organizations find it hard to disclose their information for fear of data insecurity, lack of confidentiality, Inaccuracy of information for fear of discrimination and cost of integrating the system (Lotfi, et al, 2013). The purpose of this study was to resolve whether parastatals have integrated virtual information sharing to attain relevant and precise information about their suppliers.

1.2. Research Objective

To determine the influence of e-information sharing in organization performance of parastatals in Nakuru County

1.3. Hypothesis Test

- H_0 E-information sharing does not have a significant influence on organizational performance of Parastatals in Nakuru County

2. Literature Review

2.1. Technology Acceptance Theory

It is a model that was started by Davis (1986). This is one of the widely used when there is a need to grasp the knowledge on the adoption of computer innovation and technology (Harelimana, 2018 and Surendan, 2012). The theory is affected by two factors; supposed usefulness which is the users' assumption that the system will improve their performance both in their job and their daily life, and the other factor is perceived helpfulness which is the degree to where the user will put in less effort (Surendan, 2012).

This theory or model is used in envisaging the acceptance, implementation and application of information technology. The model has had other inputs in terms of factors such as compatibility, task technology fit and cognitive absorption (Chen, Li and Li, 2011). The theory is implemented in three stages; i) Adoption where the system is first tested and adopted through several Information systems, ii) Validation where it uses the correct dimension of users' receptive behaviour for different technologies, and iii) Extension where there is new research for any new relationships or variables in the theory (Momani et al., 2018).

For any technology to be adopted into an organization there must be computerized tools for decision making and communication and due to their risky potential, there needs to be specification of preference. Due to the nature of people to resist change, the users of the technology must be made aware of this change and given the run-down of its benefits to weigh on its reception (Rotich and Okello, 2015).

Based on this theory a hypothesis was that any new technology cannot promote organizational performance or efficiency if the change has not been accepted by the employees or users of that technology (Rotich and Okello, 2015).

2.2. Empirical Review

Research concerning collaborative e-Government and sharing of information, states that Information sharing involves developing procedures and modifying company processes to sanction sharing of information alongside other organizations. It further states that when the government shares information, provides opportunities to share databases and decision making is based on complete information (Gil-Garcia et al., 2007).

Kamal, et al, (2012), examined the elements that impact informational distribution within departments in e-government agencies and found that they centre around; i) Individual factors which include the capacity for employees to trust one another with information shared, their willingness to reciprocate the information shared, and the ability to conform to information stewardship that is, free sharing of 'information power'; ii) Organizational factors that bordered on policies of that department on information sharing, the capacity for top management to support e-information sharing by providing guidance and availing needed resources financial, human, time and technology; iii) Technological factors

which cover the IT capability in terms of expertise and Security of information where only relevant users are allowed access.

A system created by (Ren, 2014) for managing supplier information between an e-procurement system and a buyer-supplier management system, was patented by the United States patent on January 21, 2014. The system provided a method that enables easy automatic mapping of customers and catalogues into the organization's system. The system provides interphase where the supplier can provide their information which is stored in an e-procurement system database.

Mung'asio and Moronge (2019) researched how blockchain affects the performance of logistics firms and Information sharing was one of its objectives. They were able to conclude that information sharing was improved firms' performance by the use of blockchain technology through the accessibility of information, automation storage reduced operational costs and eventually improving services provided.

Kumar et al., (2019) created an e-DSS system that allowed the firm to provide automatic information sharing through administering a questionnaire to the supplier when they access the system. The administrator then accesses and updates user information which will be useful for e-supplier selection.

3. Methodology

3.1. Research Design

The study applied descriptive research. This assisted in describing and attaining quantitative facts from the study to illustrate the connection between the independent and dependent variables and thus draw reliable conclusions Mustafa, (2010). A multiple regression analysis was used to determine the degree and tendency of the relationship between the variables. An analysis of Variance (ANOVA) was used to test the hypothesis made in the study.

3.2. Sample Procedure and Size

The study adopted stratified and purposive sampling to get the correct information from those who interact with the system and the suppliers regularly. Finance, Procurement, Logistics, operations and ICT departments were sampled, as they were considered the ones who frequently interact with the system and suppliers occasionally. The study, therefore, used a representative sample of 10% of the target population as recommended by Mugenda and Mugenda (2008).

3.3. Data Collection

The study used both primary and secondary data, which was derived from other publications for inferential purposes, (Pandey and Pandey, 2015). The study used a questionnaire as the main method of gathering information where the questionnaire was both open and close-ended. The questionnaire was designed using a five-point (5-1) Likert Scale from Strong Agree to Strongly disagree respectively.

4. Data Analysis

The researcher disseminated 91 questionnaires where 80 questionnaires were returned. This was done to employees/ respondents from the major departments concerned with suppliers' selection and payments. These include Finance and Accounts, Procurement/ Supply chain, operations and logistics.

4.1. Reliability Test

The study adopted Cronbach's reliability test to account for the accuracy of the Likert Scale used. From table 1 below the reliability, a test was conducted on the statements of agreement which was a total of 4 items. The Co-efficient alpha for the study reliability was found to be 0.820. This is consistent with George and Mallery, (2003) rule of thumb, where Cronbach's reliability affirms that if the alpha is above 0.80 it is considered a good scale. This shows that the scale used was reliable and could be used to provide consistent information.

Variables	SMID	SVID	TTC	Cronbach's Alpha
Virtual administration of questionnaires	98.1250	126.769	.356	.826
E-catalogues	97.6125	124.772	.589	.819
Online access to supplier's capabilities (Financial, Operational, Quality,)	97.6875	126.623	.615	.820
E-Referencing and e-referrals	98.1875	124.028	.586	.818
Real-time information accessibility	97.4250	124.906	.593	.819
Aggregate				.820

Table 1: Reliability Test for Information Sharing Coefficients

4.2. Descriptive Analysis

The descriptive analysis for the variable, where the respondents were to agree with the statements of how they acquire information from its suppliers. The respondents implied that they can collect information about their suppliers through a virtually administer questionnaire (Mean=3.3000, SD=1.19271). This is a low mean suggesting that not all organizations have the capacity to gain information about their suppliers through online questionnaires or surveys. They also agreed that supplier catalogues are available online, (M=3.8125, SD=0.90139). This is supported by (Kagai, 2013) that

organizations could access and source suppliers virtually or through the internet. Similarly, Online access to supplier's capabilities (Financial, Operational, Quality,) respondents agreed at (Mean=3.7375, SD=0.74194). This can be applied through access to suppliers' financial statements which are available in online newspapers. Also, e-references and e-referrals were agreed at (Mean=3.2875, SD=0.95790). The low mean also indicates the not all organizations can get a review of previous supplier performance or their recommendations. Finally, the respondents also agreed that the company and suppliers get access to real-time information with (Mean=4.00 and SD=0.88590). this shows that the parastatals were able to acquire prompt information about the suppliers as they occur. The above information infers that the majority of the respondents established that e-information sharing is a variable in organization performance. This low mean in the virtual questionnaire and access to supplier references is concurred by Harelimana, (2018) where suppliers fail to have enough ICT knowledge and thus cannot access the system. This is collaborated by Kipkemoi, (2017) that information sharing with the supplier has contributed to organization performance by reinforcing long term relationships which increases the level of efficiency.

Variables	N	Minimum	Maximum	Mean	Std. Dev.
Virtual administration of questionnaires	80	1.00	5.00	3.3000	1.16271
E-catalogues	80	1.00	5.00	3.8125	.90139
Online access to supplier's capabilities (Financial, Operational, Quality,)	80	2.00	5.00	3.7375	.74194
E-Referencing and e-referrals	80	1.00	5.00	3.2375	.95790
Real-time information accessibility	80	2.00	5.00	4.0000	.88590
Valid N (listwise)	80				

Table 2: E-Information Sharing and Organizational Performance

4.3. Regression Analysis

The research adopted multiple regression analysis to assess the relationship between the independent and dependent variable. The table below shows the model summary of the regression analysis. The R^2 and the adjusted R^2 as .200 and .146 respectively. This means that 14% of the reliant variable, Organization performance, can be described by the autonomous variable. The coefficients of e-information sharing predictors included real-time information access, e-catalogues, virtual questionnaire administration, Online access to supplier's capabilities (Financial, Operational, Quality,) and E-referencing and e-referrals.

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	.447 ^a	.200	.146	.39711

Table 3: Regression Model Summary

The regression equation used to associate the two variables was as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + e$$

$$Y = 2.771 - .070X_1 + .179X_2 + .008X_3 - .005X_4 + .097X_5 + e$$

The regression analysis below shows that: for every one unit increase in virtual administered questionnaire there is a -.070 decrease in organization performance, also for every one unit increase in e-catalogues there is a .179 increase in organizational performance. It also shows that for every one-unit increase in Online accessibility to supplier's capabilities (Financial, Operational, Quality,) there is a .008 increase in organizational performance, Further, a one-unit increase in E-references and E-referrals, there is a .082 increase in organization performance and finally a one-unit increase in access to real-time information there is a .097 increase in organization performance.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.771	.270		10.26	.000
Virtual administered questionnaire	-.070	.048	-.190	-1.466	.147
E-catalogues	.179	.076	.375	2.346	.022
Online access to supplier's capabilities (Financial, Operational, Quality,)	.008	.074	.015	.114	.909
E-Referencing and E-referrals	-.005	.082	-.011	-.063	.950
Real-time information access	.097	.075	.201	1.302	.197

Table 4: Regression Coefficients Table

4.4. Hypothesis Testing

In table 5 below, the data shows that the variable, E-Information sharing has a significant or P value of less than 0.005 that is $p < 0.000$. It statistically significantly predicted organization performance $F(10,79) = 5.703$, $p = 0.000$ This

implies that the significance value is low enough to reject the null hypothesis that E-Information sharing does not have a significant influence on Organization performance. This information is consistent with (Eldin et al. 2019), Information sharing when employed between organizations and suppliers contributes towards organizational performance. The study conducted emphasized that information sharing did have a statistical Significance towards organizational performance.

	Σ of Squares	df	Mean Square	F	Sig.
Between Groups	6.600	10	.660	5.703	.000
Within Groups	7.985	69	.116		
Total	14.585	79			

Table 5: ANOVA Test for E-Information Sharing and Organizational Performance

5. Conclusion, Summary and Recommendation

The study used a null hypothesis that e-information sharing does not have a significant influence on organizational performance. However, the findings ascertained that there was a positive significant influence between e-information sharing and organization performance with a P-value of 0.00004, this, therefore, invalidates the null hypothesis. The study conducted emphasized that e-information did have a positive influence on organization performance which ultimately rejects the null hypothesis. This study can conclude that the parastatals use the internet and other electronic means to gain information about their potential suppliers. It ascertained that using online means was able to improve on integrity, information tracking, improved on decision making and has made a comparison of different suppliers and their capabilities easy thus saving on time and increase in overall efficiency. However, the instance of their ability to collect that information through online questionnaires and access to suppliers' references is still a contingent factor as some of the suppliers do not have access to the internet.

5.1. Recommendation

This research advocates the parastatals to adopt the concept of educating their suppliers on the importance of using electronic means to keep a record of their work done with other companies to enable easy access to their suppliers' information which will assist them in getting relevant information about their potential suppliers and whether they can meet their requirements. This study would also like to recommend the parastatals collaboration with the suppliers to enhance systems compatibility. This study also recommends more investigation be done on how suppliers attain information about prospective customers.

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