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Determinants of E-Commerce Usage in the Kenyan Banking Sector

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Abstract
Purpose: *The study sought to investigate the factors that influence e-commerce usage in the Kenyan banking sector. Despite evidence revealing that e-commerce usage is moderated by local environment, drivers that influence its usage remains under-researched particularly in Kenya. This study was guided by the following specific objectives; determine the influence of (firm size, top management support competitive pressure, technological competence and organization learning ability) on e-commerce usage in the Kenya banking industry. Grounded on the Technological, Organizational and Environmental model (TOE), five hypotheses were tested in the study to determine the drivers of e-commerce usage.*
Methods: *A descriptive cross- sectional survey was carried out and the population of the study were all the 43 commercial banks operating in Kenya as at December 2016. A sample of 32 banks was selected using stratified random sampling, while purposive sampling was used to select 96 respondents who participated in this study. Primary data was collected using a questionnaire that was administered to the heads of ICT, Operation and Finance departments of the selected banks. Data analysis was carried out using Statistical Package for Social Sciences (SPSS) and coefficient of determination and regression analyses was undertaken to test the hypothesis.*
Results: *The study findings revealed that significant factors included; Top management support, organization learning ability, competitive pressure and technological competence whilefirm size was not supported.The study extends the existing innovation literature by revealing that firm organizational and environmental factors influence actual usage of e-commerce applications in Kenyan banking industry.Theresults also confirm the effectiveness of TOE framework for conducting studies on actual technology usage at the firm level.*

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I. Introduction

The emergence and use of Information &Communication Technology (ICT) applications such as the internet has not only changed the way business is carried out, but also opened up opportunities which have enhanced efficiency and effectiveness of the firms(Victoria, Laura, & Yolanda, 2012). Today e-commerce continue to be ranked highly of the ICT applications which are sources of new opportunities needed to promote innovation and enhance economic and social prosperity in both developed and developing economy(Benat, Crotti, & Dutta, 2014). E-commerce has played part in linking countries, people and organizations irrespective of their sizes promoting some researchers to compare it with a tidal that will wash away all the firms that do not know how to swim in it(Nobukhosi & Manillal, 2013). Due to the competitive impact of technology adoption, studies focusing on e-commerce adoption and implementation have increased in the last decade with researchers documenting various benefits such as obtaining significant returns through efficiency improvement, increasing sales, enhancing customer relationship, inventory reduction, new market penetrations as some of the many benefits realized by organizations that are successful in implementing e-commerce (Oliveira, 2012).In the last decade the banking industry in Kenya notably commercial banks have had an increased investment in e-commerce technologies in their processes. Data from the bank supervision report (2016) indicated that the number of Automated teller machines increased from 166 in 2001 to 2487 in 2013; the number of banks conducting agency banking increased from ten (10) in 2012 to thirteen (13) in 2013; all the 43 banks had initiated online presence through interactive websites by December 2013; debit cards increased from 160,000 in 2002 to over 10 million cards by 2013 while adoption of mobile banking applications also increased drastically. Despite this tremendous growth, e-commerce transaction usage gap between developing and developed nations has emerged with developed nations accounting for 95% global e-commerce transactions compared to less

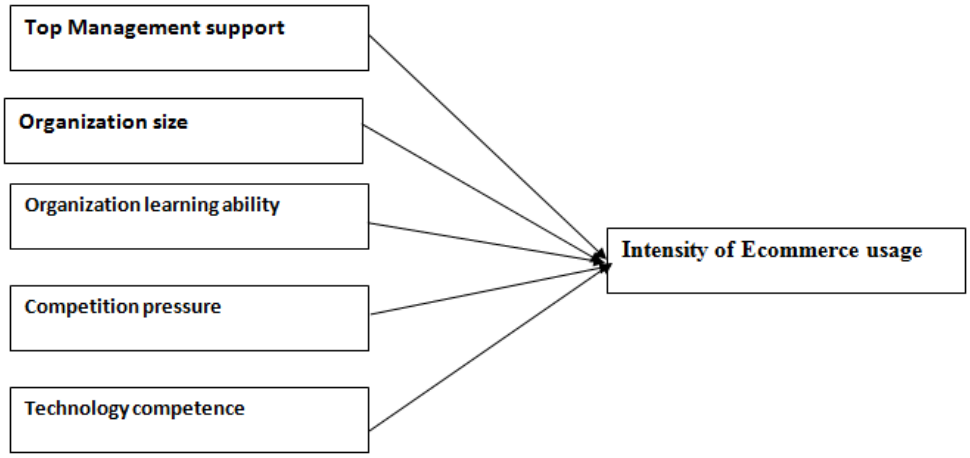
than 5% in developing countries where Africa and Middle East account for only 1.6%(UNTACD, 2012). This implies that there is skewed spread of benefits and increasing digital divide across nations. In Kenya factors influencing e-commerce usage remain unknown despite empirical evidence showing that e-commerce usage is moderated by internal environment. This study fills this gap in literature by investigating whether firm characteristics such as (firm size, management support, organization learning ability and number of employees) and external factors such as competitive pressure and technology competence influence e-commerce usage in the banking sector.

Theoretical background

Existing literature reveals that there are many documented studies focusing on technology diffusion either at an individuals or organizations perspective globally(Salwani, 2009).They include Diffusion of innovation theory (DITRogers, 1983); Technology organizational and environmental model (TOE)Tornatzky & Fleischer, 1990); Resource- based theory (RBVBarney, 1991) and E-value model (Salwani, 2009) and integrated model (Wu & Balasubramanian, 2003).An analysis of the prior studies indicates that these models differ in their focus and are designed to examine different aspects of business technology adoption(Peixin & Wei, 2012).For the purpose of this study, the theoretical foundation adopted the Technological organizational and environmental (TOE) model developed byTornatzky & Fleischer (1990). This model was selected based on the previous literature recommendation that factors that affect the propensity of e-commerce and e-business use are based on technological, organizational and environmental circumstances of a firm(Zhu & Kraemer, 2005).

Conceptual model and research hypotheses

A critical review of the previous literature reveals that about twenty factors influencing the usage of either e-commerce or e-business have been studied in the last decade particularly in developed countries. Reviewed literature also indicate that while some of the factors have reported no significant influence others reporting mixed results. The antecedents and their measurement were developed on the bases of comprehensive review of existing literature as well as a pilot study with sampled senior bank managers from three banks. Five factors that reported significant results in the previous studies and were adversely mentioned in our pilot study were adopted with some of those that reported mixed results also being included in the study.



Firm size and e-commerce usage

Firm size is one of the widely studied determinants of e-commerce adoption and usage. Some empirical studies reveal that firm size has a positive influence of e-business usage Lin (2008) while other studies have reported negative influence (Zhu & Kraemer, 2005) . According to Salwani (2009) large firms have a higher capability of e-business usage due to resources availability than small firms. Victoria et al. (2012) argued that multiple level of bureaucracy may impede decision making hence derail diffusion of these technologies. It is in right of these mixed results, which leads to our first hypothesis; ***H1****: firm size significantly influences e-commerce usage in the Kenyan banking industry*

Top management support and e-commerce usage

According to Marios & Katsikea (2012) top management support reflects the extent to which top firm managers endorse the adoption and use of the new technologies as they have the power to allocate needed resources and are able to exercise their leadership skills and capabilities for the new technology to gain

acceptance. This according to Zhu & Kraemer (2005) is important for e-business applications which disrupt structures, processes and routine. Previous literature on adoption of technology has singled out top management influence as a factor that is crucial in adoption of any technology(Oliveira, 2012). Though some studies focusing on e-business use have reported that this factor has no influence on e-commerce usage,Salwani(2009) other studies such as Marios &Katsikea(2012) reported positive influence. Based on this mixed results this forms the bases of this hypothesis ***H2:*** *Top management support significantly influences e-commerce usage in Kenyan banking industry.*

Organization learning ability and e-commerce usage

According to Wu & Balasubramanian (2003) organization learning ability refers to organization ability to evaluate, adopt and exploit external knowledge and organization needs to understand any new technology benefit before it can be adopted to improve performance. In addition it should be open to external input to develop information sources for both availability of new technologies and also effective usage (Wu & Balasubramanian, 2003). Though this factor has scarcely been tested, recent literature has reported significance influence of organization learning ability on intensity of e-business adoption in the hotel industry (Marios & Katsikea, 2012). This influence remains untested in other service industries such as the banking industry and therefore forms the bases of H3 hypotheses. ***H3****: Organization learning ability significantly influencese-commerce usage in the Kenyan banking industry.*

Technological competences and e-commerce usage

According to Zhu & Kraemer (2005) technological competence refers to technology infrastructures and IT human resource which establish the platform of building e-commerce and the skills and knowledge needed to develop these applications. Previous literature shows that I.T. capabilities consists of infrastructure, human resource and knowledge where firms with high degree of technology competence tend to enjoy greater readiness to utilize e-business in their value chain process (Zhu & Kraemer, 2005). Previous literature has revealed that technological competence has the strongest influence on e-commerce usage (Zhu & Kraemer, 2005) as organizations with greater competence will achieve greater intensity of using e-commerce. Based on these documented results of its influence this leads to the following hypothesis. ***H4:*** *Technological competences significantly e-commerce usage in the Kenyan banking industry.*

Competition pressure and e-commerce usage

Competitive pressure according to Wu & Balasubramanian (2003) refers to the degree of pressure that organization feels from their competitors within the industry. Porter (2001) analyzed competitive pressure as one of the innovation diffusion driver in the organizations. Previous literature has reported a positive influence between competitive pressure and extent of e-business adoption in the developed nations but not developing nations (Zhu & Kraemer, 2005). Other studies carried out found no significant influence on e-commerce or e-business usage by competitive pressure or competition orientation (Marios & Katsikea, 2012; Salwani, 2009). Based on these inconclusive results H6 tests the influence of competition pressure on e-commerce usage.
H5: *Competition orientation significantly influences e-commerce usage in the Kenyan banking industry.*

II. Research Methodology

The researcher adopted descriptivesurvey design to undertake this study. A descriptive study according to Kothari(2004) is a design that seeks to represent precisely the characteristics of a particular state, individual or groups.A sample of thirty two banks (32) constituted the selected sample and stratified random sampling was used to identify the banks which were sampled from different categories of the banks in Kenya. In addition a purposive sampling procedure was used to identify the senior managers to be included in this study. Three departmental heads were sampled from each bank making a total of ninety (96) senior managers in the departments which include operation, finance and ICT deemed to be relevant for this study.

Reliability and validity test

To test the reliability and validity of the data collection instrument, a pilot study was carried out where 35 questionnaires were distributed to consumers in three randomly selected customer care centers what were not included in the final study. The reliability test was supposed to test the internal consistency of the items in the questionnaire while the content validity test was carried out to determine whether the questions were clear and accurate and understandable. Table shows the Cronbach Alpha (α) of 0.9013 that was realized after the reliability test was carried out

This test was used to test reliability of the constructs measurement in similar studies as evidenced by; (Chan & Chong, 2013; Teoh et al., 2014). According to Hair (1998) a cronbach (α) value of 0.7 is considered acceptable hence satisfying the requirement

Cronbach's Alpha	Alpha based on standardized items	Number of item
	0.9013	**35**

III. Analyses And Results

Descriptive statistics

Out of the 96 questionnaires forms issued, 83 questionnaires were filled up and returned indicating a response rate of approximately 86.4%. This response rate was considered adequate based on Saunders & Lewis (2012) recommendations that a response rate of 60% was adequate. Six (6) questionnaires that were found to be incomplete were discarded and over all 77 questionnaires were dimmed fit for analyses. 64% of the respondents were male while 36% of the respondents were female. 63 % of the respondents were below the age of 40 years,30% between the age of 41 and 50 years and only 8% of the respondents were above the age of fifty. 38% of the respondents had attained a post graduate qualification, 57% university education, 7% primary and 6% diploma level of education. In the business information, 35% were local public institutions, 49% were local private institutions, while 16% were foreign owned institutions.In addition 53% of the institutions had branches outside Kenya while 47% had no branches outside Kenya. Lastly,78% of the banks sampled had used ecommerce application for between five to ten years while 13% were new in the use of these applications.

Inferential analyses

Kaiser- Meyer-Olkin measure of sample adequacy (KMO) was carried out to measure sample adequacy while Barlett test of Sphericity tested the null hypothesis that the correlation matrix is an identity matrix. The KMO test value was 0.827 which was well beyond 0.5. According to (Field, 2013) KMO test value that are well beyond 0.5 are recommended. This means that the patterns of correlations were compact and the factor analyses would yield reliable factors. Factor analyses were carried out and all the factors were found to have a value beyond 0.5.

Principal Component Analysis Test Statistics (Communalities)

	Initial	Extraction
Competition pressure	1.000	.603
ICT competence	1.000	.756
Organization learning ability	1.000	.709
Management support	1.000	.614
Ecommerce usage	1.000	.659
market share	1.000	.814

Table above shows that all the variables had a factor analyses value of more than 0.5 which according to Hair (1995) is recommended if the researcher is to proceed to hypothesis testing.

Regression analyses results

To test the hypothesis proposed in the study, all the variables were selected and entered in SPSS in order to determine the correlation with the dependent variable. A summary of multiple regression analyses was carried out where the five variables being tested were entered into the SPSS as independent variable while the variable ecommerce usage was entered as the dependent. This was done to test the influence of these five variables on the ecommerce usage in the Kenya banking industry.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1485.077	5	297.015	16.260	.000(a)
	Residual	3368.871	71	47.449		
	Total	4853.948	76			

ANOVA Model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	**.553(a)**	**.306**	**.257**	**6.88832**

The results of the significant test of regression model F value of 16.260 and sig f is 0.000 indicates that the model has a significant statistic and it indicates the "goodness" of fit of the model. According to (Field, 2013), for the model to have significant statistic meaning, the F change value
Should be greater than 10.

RSquared

The coefficient of determination R^2 and adjusted R^2 are 0.553 and 0.306 respectively meaning that 30.6% of the variation of ecommerce usage in the Kenya banking industry was explained by the five independent variables tested. R^2 value ranges from zero and one, the closer the value is to one, the better "fit" the model is.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	18.580	12.706		1.462	.148
	Management support	2.015	.614	.348	3.281	.002***
	Organization learning ability	1.760	.796	.227	2.211	.030**
	ICT competence	-1.454	.667	-.227	-2.181	.032**
	Competition pressure	.456	.399	.124	1.143	.0257**
	market share	-1.145	1.039	-.113	-1.102	.274

Coefficient of determination
Coefficients

Sig * P= 0.01 significance ** P = 0.05 significance *** P = 0.00

Results explanation

The standard coefficient of the Top management support was (0.348) and a probability significance of (0.02) which is less than P-value of (0.05) means that Top management support influences intensity of e-commerce usage in the Kenyan banking industry. This empirical result supports the null hypothesis that Top management support significantly influences intensity of E-commerce usage in the Kenyan banking industry. The standard coefficient of the organization learning ability was (0.227) and a probability significance of (0.03) which is less than P-value of (0.05) meaning that organization learning ability influences intensity of e-commerce usage in the Kenyan banking industry. This empirical result supports the null hypothesis that organization learning ability significantly influences intensity of E-commerce usage in the Kenyan banking industry.The standard coefficient of the competitive pressure was (0.124) and a probability significance of (0.0257) which is less than P-value of (0.05) means that competitive pressure positively influences intensity of e-commerce usage in the Kenyan banking industry. This empirical result supports the null hypothesis that competitive pressure significantly influences intensity of E-commerce usage in the Kenyan banking industry. The standard coefficient of the technology competence was (-0.227) and a probability significance of (0.032) which is less than P-value of (0.05) meaning that technology competence significantly influences intensity of e-commerce usage in the Kenyan banking industry. This empirical result supports the hypothesis that technology competence significantly influences intensity of E-commerce usage in the Kenyan banking industry. Lastly the standard coefficient of the Market share was (-0.113) and a probability significance of (0.274) which is more than the probability value of (0.05). It seems that E-commerce usage intensity and market share which denoted (Firm Size) was not significantly correlated. This empirical result does not support the hypothesis that the size of the firm significantly influences intensity of E-commerce usage in the Kenyan banking industry.

IV. Discussion and conclusions

The main objective sought to determine the drivers that influence e-commerce usage in Kenyan banking industry. Based on the finding and the TOE framework, competitive pressure, management support, technology competence and organization learning ability were found to have significant influence on e-commerce usage where by top management support seem to be the strongest factor. This finding implies that for the usage of new technologies such as e-commerce to be enhanced in the banking industry, the top management should be willing to provide maximum support both in resources and leadership. According Zhu & Kraemer (2005) top management must exercise their leadership skills and capabilities for the new technologies to be accepted internally and also by external partners as they disrupt existing structures, systems, processes and routines. This finding is consistent with conclusions made by Lin (2008) that management commitment is needed to avoid suspicion and implementation failure that have largely been attributed to lack of top management support during IS implementation. In addition, as technology is changing rapidly, firms must develop an efficient process of acquiring information on the new technological development and establish an internal system of distributing this information in its departments and other units. This will enhance improved awareness on these technologies and minimize any resistance within the organization. Lastly, Banks that are able to create and gain value through the use of a given technology may create a competitive edge over their rivals and because technology by its nature can be imitated and copied will lead to other banks adopting and growing technology diffusion. Further, the negative and significance influence of technology competence on ecommerce usage reveals that the fact that respondents had acknowledged that capacity building was minimal and abundant availability of the resources are mostly in large banks technology competence of the human and physical capital influenced the usage or ecommerce even in small firms. The respondents had also indicated that technical training on internet based technologies was not common in the banks and this may have influenced these negative outcomes. This outcome is consistent with previous studies like Zhu & Kraemer (2005) have argued that e-commerce application is enabled by existing technology base available within the organization which in this case is both technical and human capability.

On the contrary, firm size was found to have no significant influence on e-commerce usage.The negative coefficient indicate that contrary to the believe that large firms have abundant resources which they can commit in technology innovation investments, small firms have high capacity of utilizing e-commerce to a higher extent probably because large firms are pulled back by structural inertia occasioned by huge organizational structure hence slowing down the adoption and implementation of these innovation.

V. Contribution and limitations

This study contributes to the literature by revealing the important drivers that influence e-commerce usage in the Kenyan banking industry. The study shows that both organization factors and environmental factors are important drivers ofe-commerce usage. The findings of this study indicate that top management support has the most significant effect on the e-commerce usage in the Kenyan banking industry. Due to high competition in the market, top management support and leadership of new technologies that would create competitive edge to the firms is a critical factor for successful implementation of any technological innovation. Competitive pressure was also found to be strongly significant indicating that firms operating in Kenya must regularly be scanning the external environment and gather intelligence on their competitor's e-commerce development in order to remain competitive in the market. Firms should also enhance their use of new technology innovation as this would enable them to change the rules of competition, influence the industry structure and innovate new ways of outperforming the rivals hence changing the market landscape.

Limitation and further research

Based on the limitations provided above, the researcher recommends the following areas of future studies. Firstly, the focus of this study was on the determinants of the usage of e-commerce in a business perspective. Future studies can focus on either the government or individual usage perspective and also use the model to study other individual e-technologies. Secondly, the study focused only on the banking industry specifically commercial banks; it would be interesting to observe the findings of a similar study if this model was replicated in other industries. Thirdly, the study focused on a few drivers influencing e-commerce usage, future studies should include other drivers that were not tested. Lastly though small and medium banks were included in this study, based on a Kenyan context they are categorized as large firm hence in order to test the applicability of the model in all levels of business, the study should be replicated in SMEs and other micro-enterprises.

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