

ELECTRONIC COMMERCE ADOPTION AND PERFORMANCE OF SMALL AND MEDIUM ENTERPRISES IN MURANG'A COUNTY, KENYA

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Abstract: Small and Medium Enterprises (SMEs) have a lot of potentials when it comes to electronic commerce. There is evidence that SMEs in developing countries, such as Kenya, are reluctant to adopt e-commerce. Failing to reach an acceptable level threshold tends to hinder businesses from realizing the full benefits of technology adoption. The general objective of the study was: to determine the effect of E-commerce adoption and performance of Small and Medium Enterprises in Murang'a county. The Specific Objectives of the study were: To determine effects of computing infrastructure affects and the performance of SMEs in Murang'a County, to assess the influence of ICT computing skills on the performance of SMEs in Murang'a County, to evaluate the effects of information storage on the performance of SMEs in Murang'a County and lastly, to examine the effect of service delivery and the performance of SMEs in Murang'a County. The study established that computing infrastructure, ICT computing skills, availability of information storage and availability of service delivery had a positive and significant influence in profitability, market growth and new customers attracted on the performance on SMEs. The study concludes that with the right operational methods to manage IT infrastructure, performance in the company is improved. Ensuring that the staff have the right set of skills is also vital in enhancing the company's performance. The use of efficient storage systems, such as digital storage enables easy access of resources and information online, hence enhancing better performance. Ensuring that services are clearly defined and available ensures that customers get what they want at the right time.

Keywords: Computing Infrastructure, ICT Computing Skills, Information Storage, Service Delivery and Performance.

1. INTRODUCTION

1.1 Background of the Study

Globalisation and the rising trend of manufacturing methods have altered operations management, posing a novel problem for small and medium enterprises (SME). The majority of studies claim that the impact of information and communication technologies (ICT) on productivity is positive and important (Liao *et al.*, 2016; Corrado *et al.*, 2017). Taher (2012), when resources become scarce, can gain long-term competitive advantages by using them. Within that vein, ICT investments are essential in and of themselves due to the operational benefits of ICT usage and interdependencies with intangible assets like human resources, skills, and organisational capital. Electronic commerce (e-commerce) has emerged as a strategic tactic and platform for SMEs to stay competitive (Yang *et al.*, 2015; Abebe, 2014; Raymond *et al.*, 2011; Wirtz *et al.*, 2010; Kapurubandara, 2009).

According to (Elseoud, 2014) the developments witnessed in the latest models of business, markets as well as new products in electronic commerce, have enabled better handling transactions of sales between the company and other

organizations and even individuals. Small and medium enterprises (SMEs) make up the bulk of companies worldwide, with an estimated 420 million to 510 million SMEs in 2015 (International Trade Centre, 2015). Online applications are not limited to any one stage of the business production chain and can be applied to a wide variety of industries and businesses. Brand design and manufacturing, and logistics have been found among early adopters of electronic commerce technologies in the United States (OECD, 2000).

Faloye (2014) almost every African capital city now has some amount of internet connectivity. Nevertheless, there are still substantial gaps in internet use across Africa's various regions; however, the global growth of internet users has significantly increased in recent years. Despite the possible benefits of e-commerce, Nigerian SMEs are slow to embrace the technology. Manyika *et al.* (2013), the Communication Authority of Kenya (CA), announced in 2013 that the number of internet users in Kenya had increased to 21.2 million. The use of cell phones and the internet in Kenyan cities is much higher than in rural areas. The country has a 72 per cent mobile phone penetration rate. In urban areas, 72 per cent of people are online, 95 per cent have internet-capable phones, and 31% own smart phones (Manyika *et al.*, 2013), demonstrating the widespread availability of the internet.

1.2 Statement of the Problem

Kshertri (2010), in the recent past, e-commerce has become an essential element of business in many developing countries, as shown by the substantial benefits it provides. Many major corporations have adopted them, giving them a strategic edge over MSMEs. SMEs are becoming increasingly relevant in developed countries because they account for a significant portion of the company population. Majority of SMEs in upcoming economies cater to local markets and depend mainly on local content, and knowledge is at the root of this.

While studies on SMEs' adoption of e-commerce have been conducted worldwide, the majority of these studies have focused on relatively industrialized nations like China (Grandon & Pearson, 2012) and New Zealand (Al-Qirim, 2007). Several studies have been carried out in growing countries such as Malaysia (Alam, 2009), Nigeria (Faloye, 2014), and Ghana (Faisal, 2012). A few studies have explicitly concentrated on the adoption of e-commerce by SMEs in transition economies (Li *et al.*, 2010; Kapurubandara, 2009). Africa hasn't gotten enough attention, and the study has mainly focused on South Africa. Furthermore, existing research is fragmented, providing minimal insight into the actual state of e-commerce adoption and success among SMEs. Moreover, current studies have contradictory findings, use incomprehensible main variables, and take a broad perspective in business processes or operations. This research aimed at exploring how the factors have impacted the use and success of e-commerce in SMEs within Murang'a County and also provide a reflection to the SMEs on how they can successfully use e-commerce for their growth and development as well as convenience

1.3 Objectives of the study

1.3.1 General Objective

To determine the effects of e-commerce adaptation and performance of small and medium enterprises in Murang'a County.

1.3.2 Specific Objectives

- i. To investigate the effect of computing infrastructure and the performance of SMEs in Murang'a County
- ii. To assess the influence of ICT computing skills on the performance of SMEs in Murang'a County
- iii. To evaluate the effect of information storage on the performance of SMEs in Murang'a County
- iv. To examine the effect of service delivery and the performance of SMEs in Murang'a County

2. LITERATURE REVIEW

2.1 Theoretical Review

Technology Acceptance Model Theory is the oldest and regarded as among the first theories for covering Information Technology (IT) adoption. The theory provides the basis behind understanding the effects of the external variables while adopting e-commerce, with its primary assumption being made on attitudinal, economical and practical grounds. Many of the theory's supporters argue that perceived usefulness is affected by the perceived ease of use, and the two can easily predict people's attitudes (Ramanathan, Ramanathan & Hsiao, 2012). Even though the theory has been validated

empirically and applied extensively, it only provides less meaningful information about the users' opinions and how they adopt specific systems by reducing its constructs to expected ease of use and perceptions on usefulness. Perceived usefulness is described as a user's subjective assessment of a computer's ability to improve job performance when performing a task. Perceived ease of use relates to a person's understanding of how easy it is to use a computer device, which influences perceived utility and, as a result, has an indirect impact on consumer acceptance of technology.

Perceived E-Readiness Model was developed by Licker and Molla (Mutua, Oteyo & Njeru, 2013). For the context of developing economies. The model considers the internal factors in the organisation called perceived organisational e-readiness (POER) and external factors called perceived e-readiness (PEER) as vital for the adoption of e-commerce. According to Lip-Sam & Hock-Eam, (2011), POER entails the following elements: the organisation's awareness, understanding, and forecast of e-commerce and its possible risks and benefits (imperative innovation attributes), its managers' engagement, and vital organisational elements such as personnel, procedures, and business infrastructure.

2.2 Empirical Review

2.2.1 Computing Infrastructure

According to Puschmann and Alt (2001), the non-integrated design of many ICT technology creates several problems for organisations that need to incorporate their information systems and have their business operations totally automated. As a result, a technology that produces a scalable, operational, and sustainable embedded ICT infrastructure is required. Differentiation and, as a result, competitive advantage can be achieved with such infrastructure. The current IT infrastructure of an organisation affects the implementation of EAI, as the infrastructure's requirements also drive the adoption of system implementation.

El-Nawayi and Ismail (2006) state that the lack of an adequate and safe e-commerce-enabled environment is a deterrent to e-commerce ventures, but it is not a well-grounded reason to avoid them. As a result, good infrastructure lowers the cost of doing business, fostering competitive private sector growth. Golicic et al. (2002) note that to promote and sustain small business networking and IT, both industry and government institutions have a role to play. They discovered that the Australian government had created programs for small businesses to provide national database structures, utilizing the internet as a universal model for information that encompasses all elements of telecommunication.

2.2.2 ICT Computing Skills

Koh and Maguire (2004) point out that technological changes and their effect on workforce numbers and skills pose a severe challenge in companies. SMEs find it hard to justify a sizeable financial investment in a region that is not considered a central component of their operations. They further note that SMEs have access to a wide variety of internet applications. However, it is unclear if they are completed using them to achieve a competitive edge. The adoption of e-business in its present configuration is impossible due to a lack of resources and expertise in both the technological and business fields.

According to Wielicki and Arendt (2010) observed in a study conducted through USA, Poland, Portugal and Spain amongst SMEs on e-commerce depicted those countries that adopted use of ICT computing skills greatly contributed to application of ICT based-knowledge on their enterprises. This had largely contributed to readiness of most e-commerce individual SMEs in their own states. In reference to the rankings of the global network readiness (GITR, 2012), found out that most developing nations including Kenya experience low network connection status readiness that has greatly challenged the urge for adoption of e-commerce in most of its SMEs. Therefore, this study evaluated the contribution of ICT computing skills on e-commerce adoption and the performance of SMEs in more prospects of holistic nature.

2.2.3 Information Storage

According to Akinyede (2018), asserts that a typical e-commerce chain includes a hardware manufacturer, Internet service provider, network integration provider, software developer and service provider, all of whom serve as the company's backend and provide technical support. With the integration of infrastructure into electronic commerce, it will be easy to enhance better infrastructure in the industry. The new developments such as virtualization have created better ways to ensure that not much physical infrastructure is needed in companies. Companies are able to protect their data online and access it, even if they do not have physical systems in their physical locations. This is a better way of ensuring that resources within the company are distributed and shared efficiently.

Shuai (2011) outlines the difficulties faced by Chinese m-learning, which include limited mobile device resources, restricted storage capacity, and costly hardware and software investments. Cloud computing has the potential to remedy the problem due to its dependability and ease of customisation. All of these potential benefits, however, are described theoretically rather than experimentally.

Juncaai and Shao (June, 2011), safety is one key factor in information security crisis and privacy to various users of cloud computing in e-commerce. Most researchers argue that most providers of cloud services state that they provide more secure and reliable centre for data storage. There still exists gap to the users on where to locate their stuffs, operation mode, staff situation among other considerations. Additionally, in an environment that's multi-tenant it's a challenge for various providers of cloud computing providing a levelised more specific environments that are isolated to single customer model. According to a study conducted by International Data Corporation (IDC) found out that users rated high challenges and issues experienced in cloud computing. Therefore, prompting concerns of security of information stored, its availability as well as performance issues in most e-business.

2.2.4 Service Delivery

Frempong (2009) notes that SMEs in Ghana is actively involved with various types of business using mobile telephony in a survey of SMEs. Donner and Escobari (2010) describe how SMEs use cell phones to alter the business processes within the company and enlarge business relations outside conventional landlines. Although significant growth in e-commerce uptake via cell phones, the social media services continue in the context of many other impediments, such as trade barriers placed on poor developing countries by wealthy nations and influential multinational companies. Since SMEs are already resource-constrained, some researchers are pessimistic that they will respond to global and local e-commerce demand (Winch & Bianchi, 2006).

Web-based business transaction services such as license issuance, tax payments and procurement, can help make services more transparent, accessible, and secure (Mincomunicaciones, 2007). According to Locke (2006), when properly conceived, these e-government portals can also assist SMEs in quickly obtaining information, saving them time, contributing to their knowledge generation, and generating new business activities (i.e., profit). This can help SMEs better understand social concerns (such as regulatory and environmental issues) that can affect their operations. If these advantages are realised, organisations and citizens, in general, will be able to contribute to the long-term enhancement of their reputation and confidence in their governments.

3. RESEARCH METHODOLOGY

3.1 Research Design

A descriptive cross-sectional design was applied in the research to determine how the adoption of electronic commerce in its performance of SMEs relates.

The study targeted SMEs that included; transport services, manufacturing, retail and wholesale shops, hotel and catering services, among others operating across Murang'a County, which have valid business permits or licenses from the county government administration. According to Ndung'u (2016), there are 1,020 registered or licensed SMEs operating in Murang'a County.

The population was sampled through a stratified sampling technique in coming up with a different proportionate category of SMEs. Therefore, the study used a sample of 102 licensed business owners/managers that were relevant to the study objectives. The sample size was calculated as follows:

$$\begin{aligned} & \{0.1 \times 1020\} \\ & = 102 \text{ participants} \end{aligned}$$

The researcher employed semi-structured survey questionnaires in collecting primary data in this study. The questions were structured in a manner that contained both the open-ended and closed questions.

4. RESEARCH FINDINGS AND DISCUSSION

4.1 Response Rate

The research sought to interview 102 participants in order to acquire data from a variety of small and micro enterprises. In the survey, 78 out of 102 returned questionnaires completed the questionnaires, yielding a response rate of 76.5 % (table 4.1), that's greater than the response rate criterion, indicating an excellent return rate. A response rate of 50% is suitable

for analysis and reporting, a rate of 60% is good, and a rate of 70% or more is great (Mugenda & Mugenda, 2003). The high response rate was attributed to the self-administration of questionnaires with the support of research assistants who were present at all times at the relevant SMEs in Murang'a County.

4.2 Regression Analysis Results

Regression analysis was used to assess the influence of one variable on the other in the study inferential statistics aimed at establishing how the adoption of e-commerce affects the performance of small and medium firms. Table 4.1 summarizes the findings.

Table 4.1: Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.846 ^a	.646	.639	.65486
a. Predictors: (Constant), E-commerce Services (ES), Computing Infrastructure (CI), Computing Skills (CS), E-commerce Information (EI)				
b. Dependent Variable: Performance of SMEs (P-SMEs)				

Table 4.1 revealed that the value of R square was 0.646 suggesting that there exists a strong relationship between the independent variables (computing infrastructure, ICT computing skills, and information storage and services delivery) and dependent variable (performance of SMEs). In addition, Table 4.1 showed that the adjusted R square was 0.639 this shows that 63.9% of all the variations in performance of SMEs is explained by computing infrastructure, ICT computing skills, information storage and services delivery while the remaining 36.1% of the variations is explained by other factors other than those included in the model.

The analysis of variance results is as shown in Table 4.2.

Table 4.2: Variance Analysis Results

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.598	4	.399	1.176	.000 ^b
	Residual	24.800	73	.340		
	Total	26.398	77			
a. Dependent Variable: Performance of SMEs (P-SMEs)						
b. Predictors: (Constant), Computing Infrastructure (CI), ICT Computing Skills (CS), Information Storage (IS), Service Delivery(SD)						

The strategic responses had a $F = 1.176 > F_{critical} (0.399)$ in Table 4.2, showing that the model was appropriate in forecasting the SMEs performance.

Table 4.3: Regression Coefficients of the Predicting Variables

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.539	.490		6.610	.000
	Computing Infrastructure (CI)	0.729	.046	0.066	2.781	.001
		0.692	.098	0.118	2.980	.001
	ICT Computing Skills (CS)	0.539	.125	0.145	3.313	.000
	Information Storage (IS)	0.712	.073	0.093	1.532	.001
	Service Delivery (SD)	0.539	.490		6.610	.000
a. Dependent Variable: Performance of SMEs (P-SMEs)						

The findings in Table 4.3 reveals that the constant value at 0.539 represents the value at which performance of SMEs changes when computing infrastructure, ICT computing skills, information storage and services delivery are kept at constant.

The study found that a 0.729 represented the amount by which performance on SMEs changes when computing infrastructure is changed by one unit keeping ICT computing skills, information storage and service delivery constant. The t-value ($t = 2.781, p < 0.05$) of the study revealed that computer infrastructure had a favourable and significant impact on the performance of SMEs. This is in line with the conclusions of a study conducted by Javaid (2014), which examined the use of cloud computing by SMEs and discovered that cloud computing service providers handle IT support, expensive equipment and licenses,. They also make certain that their computers have the most recent software versions loaded.

Further, the study found that a 0.692 represented the amount by which performance on SMEs changes when ICT computing skills is changed by one unit keeping computing infrastructure, ICT computing skills, information storage and service delivery constant. According to the t-value ($t= 2.980$, $p < 0.05$), ICT computing abilities had a positive and substantial influence on the performance of SMEs in Kenya. This is corroborated by the findings of Lehner's (2018) study, which looked at the relationship between ICT skills and capabilities for SMEs and discovered that IT system knowledge, abilities and skills have proven to be a vital asset and success element for SMEs.

The study found that 0.539 represented the amount by which performance on SMEs changes when information storage is changed by one unit keeping computing infrastructure, ICT computing skills and service delivery constant. According to the t-value ($t= 3.313$, $p < 0.05$), information storage exhibited a positive and substantial effect on the performance of SMEs in Kenya. This is in contrast to Caroline, Mugun, and Loice's (2015) study, which looked at the relationship amongst knowledge storage, retrieval, and employee commitment and concluded that there is one.

According to the study, 0.712 represents the amount by which SMEs' performance changes when information storage is changed by one unit keeping computing infrastructure, ICT computing skills and information storage constant. As revealed by the t-value ($t= 1.532$, $p < 0.05$), service delivery had a positive and substantial influence on the performance of SMEs in Kenya. This is in consistent with the findings of Jahanshahi, Rezaei, Nawaser, Ranjbar, and Pitamber's (2012) study, which examined the impact of electronic commerce on organizational performance and found important connection with both electronic commerce applications as well as operational and market-based performance.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusion

The study concludes that having adequate techniques in place for managing the IT infrastructure allows for enhanced performance, increased availability, and quick resolutions to various issues that may develop. A well-managed computer infrastructure improves the performance of technological systems, boosts uptime, and improves the user experience. Provides assurance that the organization's systems will continue to perform at peak levels for a longer period of time than a system and allows employees to work at peak efficiency.

The study concluded that hiring employees who have good ICT skills is paramount towards ensuring that the firm operates efficiently. The workers who are able to effectively use ICT systems will have an easy time dispatching their duties, also helping them add more skills in the process of learning. Employees are capable of implementing and utilizing technology that will assist them in attracting clients. Employees are more prepared to use computer systems and deal with problems as a result of this training.

The study concludes that having efficient and reliable storage systems enables employees to search for documents in a variety of ways, and find them within the shortest time possible. A well-organized information storage and retrieval system improves the working environment within the organization. When storing information electronically, records are kept securely and can be accessed from any location. Cloud and online storage of information enables companies to have efficient and automatic backups that ensure their data is safe and accessible any time.

The study concludes that properly defined services enable customers to understand service offers, such as what each service includes and does not include, eligibility, service restrictions, cost, how to request services, and how to receive help. A well-defined service also outlines the internal processes that are required to provide and support the service

5.2 Recommendations

SMEs should take some e-commerce training programs, particularly on website design, to understand the value of implementing e-commerce and efficiently use all tools to give their businesses a competitive edge. To benefit from electronic commerce, small and medium enterprises should invest in more effective hardware, which will make their operations more efficient. Small and medium enterprises should invest in high-speed internet connectivity and better software to enhance speedy communications and operations in their respective businesses. SMEs should boost their computing infrastructure and build capacity for computing skills because they are statistically significant predictors, contributing significantly to their performance in competitive markets.

Further, the study recommends in allowing businesses to expand, developing appropriate capacity building programs for the managers and owners as well as workers, and enhancing ICT infrastructure must all be prioritized, while environmental factors must also be considered. Recommended the effect of no rating on computer elements on SMEs'

computer adoption. To compete effectively and ensure timely communications and up-to-date trends, SMEs should always strive to get important e-commerce information such as market trends, the latest products and pricing, making the businesses competitive and effective in their operations.

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