Factors affecting the adoption of e-commerce in SMEs in Kenya

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Abstract: Research has shown that Small and Medium-sized Enterprises (SMEs) are rapidly adopting the electronic commerce (e-commerce), to enable them to compete on par with their larger counterparts. Previous studies have indicated that significant benefits are achieved by those SMEs that adopt and use e-commerce in their organisations. However, such benefits have not been realised in SMEs in developing economies like Kenya owing to the slow adoption of e-commerce. Consequently, this paper establishes that there exists a positive relationship between costs of e-commerce implementation, Information Technology (IT) skills and training, with e-commerce adoption by SMEs.

Keywords: SMEs; small and medium-sized enterprises; e-commerce; adoption; IT skills; training; technology intelligence.


Biographical notes: Jimmy Macharia is an Assistant Professor of Information Systems and Technology at the United States International University. Before becoming a Professor in 2002, he spent more than 10 years in academia, research and consultancy. His research interest includes information systems evaluation, ICTs adoption, diffusion, integration in education, governance, strategy and SMEs.

1 Introduction

The advent of the ubiquitous internet has delivered a plethora of latent opportunities for small firms or entrepreneurs to creatively engage in new value-creating activities (Jones et al., 2003). According to Van Akkeren and Cavaye (1999), it is increasingly widely accepted that it is important for business to embrace e-commerce and to adopt internet technologies. E-commerce technologies include searching for products, services and information, advertising, and the buying, selling and paying for products or services. Papazafeifopoulou et al. (2002) noted that e-commerce is a powerful new way of conducting business and one that presents many opportunities for companies and consumers. This line of thought agrees with Ashon and Klavan (1997) quoted in Fleisher
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Where he has argued that developing, acquiring or applying the appropriate technology like e-commerce at the right time are the key facets of business success in many different competing marketplaces like those of SMEs.

Although small businesses may not have the money and expertise to build a sophisticated web presence, the adoption of e-commerce technologies is important for their ongoing survival (Van Akkeren and Cavaye, 1999). They further identified that e-commerce improves the ability of small businesses to compete with larger organisations, enables the small business to operate on an international scale and e-commerce technologies provide a cost-effective way for small organisations to market their business, launch new products, improve communications, gather information and identify potential business partners.

Barry and Milner (2002) found a number of characteristics on SMEs weaknesses including a lack of time, resources, technology and the sectors’ short-term planning perspective, which create problems for SMEs in developing products or services and using new technology. These are potential hindrances to innovation and adaptability and, therefore, may affect the implementation of e-commerce. Papazafeiropoulou et al. (2002) found that SMEs hesitate to adopt ICT elements such as e-commerce for reasons that include resistance to change, lack of education about the potential of e-commerce and lack of trust in the security of e-commerce transactions. Many studies capturing statistics focus on sophisticated internet technologies like the use of e-commerce by small business. However, it is important to recognise that e-commerce activities range from entry-level activities such as having web browsers, websites, and e-mail, to sophisticated activities such as online payments, making purchases online, customer services and video conferencing, amongst others (Cloete et al., 2002). Van Akkeren and Cavaye (1999) emphasise that the adoption of e-commerce practices is a progression, and therefore sophisticated technologies are unlikely to be adopted before entry-level technologies have been successfully adopted. These entry-level activities provide the necessary technological infrastructure from which more sophisticated e-commerce activities can be developed (Cloete et al., 2002). Additional factors that also inhibit that adoption of innovations such as e-commerce in organisation like SMEs include organisational politics (Gerst and Bunduchi, 2007) and uncertainty conditions (Petrick and Provance, 2005) associated with selection of technology such as e-commerce.

1.1 Statement of the problem

Kaynak et al. (2005) investigated the e-commerce adoption profile of SMEs in Turkey as well as the factors affecting their willingness to adopt e-commerce usage. Their study was significant for two reasons; first, it presented new data and insights into the internet-based e-commerce adoption in SMEs. Second, the study focused on a relatively unexplored research area in an emerging market – Turkish SMEs. Poon and Swatman (1999) conducted a study on small business internet commerce (SBIC) and found that the phenomenon is still in its infancy, although small businesses are finding e-mail useful for business communication and document transfer; the perceptions of long-term benefits and potential businesses opportunities are the driving factors. E-commerce is touted as a global phenomenon. Despite this, most studies of e-commerce have focused predominantly on developed Western countries. While it is extremely important to understand e-commerce in the context of more advanced countries, it also impacts developing countries (Kaynak et al., 2005). As Poon and Swatman (1999) noted,
e-commerce use in SMEs is still at its infancy despite the benefits indicated by different studies. This study, therefore, sought to build on the knowledge of e-commerce adoption in emerging markets by focusing on a developing country – Kenya. The general objective of this study was to determine the factors that influence the adoption of e-commerce by SMEs in Kenya. This research environment is of critical importance, because it falls in what Haapaniemi (2006) calls ‘low-income countries’ where his empirical studies found that the adoption of innovations such as e-commerce takes off with a smaller number of adopters and thus affecting the entire adoption path. The specific objectives were to determine if:

i knowledge of benefits

ii infrastructure

iii cost of e-commerce implementation

iv technical skills and IT knowledge amongst owners and employees, influences the adoption of e-commerce by SMEs in Kenya.

The findings of this paper are of practical significance to the development of e-commerce sub-sector in developing countries.

2 Literature review

This section of the paper will discuss information derived from previous studies that are related to the current study and has focused more on the selected factors that were investigated on their influence to the adoption of e-commerce in SMEs.

2.1 Knowledge of benefits derived from e-commerce

Cloete et al. (2002) found that several studies have researched the benefits of the adoption of e-commerce in an organisation. While the potential benefits have been established, a number of inhibitors to the adoption of these new business models still exist. For small businesses, the advantages of e-commerce adoption are often not perceived to be applicable and few success stories are available to convince owners of such firms that e-commerce offers a real benefit to their organisations.

However, according to Cloete et al. (2002), despite these potential benefits of e-commerce to an SME, there seems to be a perception by owners of SMEs that there is a lack of business benefit, if the input is weighed against immediate returns. Due to the fact that the ownership and decision-making power in an SME is held by just one or two people, adoption of e-commerce into such an organisation is heavily reliant on these people’s acceptance of a technology. The potential user of e-commerce must not only be convinced of the relevant usefulness of e-commerce (advantages), but she or he must also have a positive attribute towards it (embrace EC); the user must be comfortable with the technology employed (ease of use), although she or he expects factors affecting acceptance of the technology to be beyond the control of the user (external variables).
A model proposed by Kirby and Turner (1993) as cited by Van Akkeren and Cavaye (1999) identifies adoption factors as the computer literacy of the small business owner, lack of knowledge of benefits derived from IT, and dependency of the small customer on the supplier. Their review also identified individual characteristics (CEO innovativeness, attitude towards adoption of IT and IT knowledge), and organisational characteristics (business size, competitiveness of environment, information intensity).

Overall, according to Martin and Margi (2005), perceived benefit is the main driver for internet adoption with some evidence of external pressure, particularly for those SMEs with close relationships with their customers. The principal benefits of internet-based e-commerce that are more relevant for SMEs include: direct savings such as product promotion, new sales channels, quick product delivery, more satisfaction of customers, inexpensive advertising medium, enhanced company image, new business opportunities, efficiency in information gathering and better support from suppliers (Kaynak et al., 2005).

Republic of Kenya Sessional Paper No. 2 (2005) notes that access to markets and marketing information is a severe constraint to Micro and Small Enterprise (MSE) development in Kenya. Many MSEs are ill-equipped to compete in liberalised markets. Very few are capable of venturing into export markets and even fewer are able to tap the new market frontiers through e-commerce. This failure to harness the benefits of e-commerce has confined most SMEs to very narrow local markets where intense competition drives prices down, resulting in very low profit margins. This phenomenon, in addition to the small capital base and limited technological sophistication, confines MSEs to products and services, which cannot compete effectively in a globalised and competitive environment due to quality limitations.

2.2 Infrastructure influence in e-commerce adoption

E-commerce is still in an early stage and a number of related issues are not yet solved – security, privacy, data protection, encryption, copyright and intellectual property. The constantly evolving policies and rules governing the internet and its operations will affect the future of global e-commerce. Given the enormous economic opportunities at stake for all companies across the world, developing countries should be involved as equal partners in the development of the growing body of internet governance (Golicic et al., 2002).

According to Van Akkeren and Cavaye (1999), both industry and government bodies have a role to play in promoting and supporting small business networking and IT. They found that Australian government initiatives for small business have been developed to provide national information infrastructures, using the internet as a global information model, encompassing all aspects of telecommunication.

The non-integrated nature of most ICT infrastructure causes numerous problems to organisations, which need to unify their information systems and fully automate their business processes. There is, therefore, a need for a technology that results in a flexible, manageable and maintainable integrated ICT infrastructure. Such an infrastructure can lead to differentiation and therefore competitive advantage. The existing IT infrastructure of an organisation is a factor that affects the introduction of EAI, as the needs of the infrastructure often stimulate the process for adopting application integration (Puschmann and Alt, 2001).
According to El-Nawayi and Ismail (2006), the non-existence of an appropriate and secure e-commerce-enabled environment is a disincentive to attempting e-commerce projects but is not a well-grounded justification for avoiding such attempts. Republic of Kenya Sessional Paper No. 2 (2005) notes that the inadequacy of infrastructure is a principal cause of low levels of investment and unsatisfactory performance of MSEs. The term infrastructure relates to adequate electrical power, access to roads, water and sewerage, security of tenure of premises, and telecommunications (CBS, 1999). Good infrastructure has the effect of promoting competitive private sector growth by lowering the cost of doing business.

The Economic Recovery Strategy Paper 2003, as cited in Republic of Kenya Sessional Paper No. 2 (2005), has identified poor infrastructure as a critical factor that constrains profitable business in Kenya. Infrastructural problems include inaccessibility to land, workspace, feeder roads, electricity and other utilities. Limited access to electricity by MSEs is compounded by the fact that the MSEs are expected to obtain an approval from Local Authorities before a connection can be made. In addition, energy costs in Kenya are extremely high and have a negative impact on all businesses, large and small scale alike. This constraint limits MSEs technological capacity thereby adversely affecting the competitiveness of their products and services (Republic of Kenya Sessional Paper No. 2, 2005).

2.3 Cost of implementation of e-commerce

According to Koh and Maguire (2004), a major constraint for small firms in the area of e-business may be their inability to make the necessary investment to take advantage of the new concepts and ICT. They may have to rely on outside consultants, which are problematical, as most small firms cannot afford to employ private consultants. Costs of implementation of e-business can be a serious barrier for SMEs. Although limited resources are a distinguishing characteristic of SMEs and thus a barrier for them to compete in the global e-business sector, there are also many counter-balancing advantages as well. An obvious advantage is that small and medium-sized companies are usually more entrepreneurial and willing to experiment and innovate in terms of business models and operations than larger organisations with established hierarchies. Thus, government initiatives aimed at increasing the e-business readiness of SMEs can result in a higher level of national competitiveness in this crucial sector. Dawn et al. (2002) and MacGregor and Vrazalic (2005) found that despite government support and the exponential growth of e-commerce, it is mainly the larger businesses that have reaped the benefits of this technology. The sluggish pace of e-commerce diffusion into small business has been attributed to various barriers or impediments that are faced by these organisations. High costs associated with e-commerce have been identified in several studies as one of the barriers to the adoption of e-commerce.

They also found that high costs as a barrier to the adoption of e-commerce by SMEs arises from the fact that small businesses face difficulties obtaining finance, unlike their larger counterparts (MacGregor and Vrazalic, 2005). If the finance was readily available to small businesses, high cost may not be a barrier to e-commerce adoption. The exact nature of the relationship between the unique features of small business and cost-related barriers is a topic that they proposed for further research.
Taylor and Murphy (2004) noted that the high initial set-up costs and perceived ongoing costs of IT and e-business can act as a barrier to take-up among SMEs. These firms can find that they cannot finance the necessary additional investment. Equally, that investment might not be cost-effective, and it might be better for the firm to outsource its IT activities. The 1993 Baseline Survey as cited in the CBS (1999) showed that only 9% of the MSEs had accessed credit and that only 4% of this credit was obtained from formalised financial channels (NGO microfinance schemes, commercial banks, SACCOs, etc.). The survey noted that the bulk of MSE credit came from informal savings and credit associations (ROSCAs), friends and relatives.

2.4 Technical skills and IT knowledge amongst owners and employees

Bowles and Wilson (2002) noted that in the study of SME demand for IT and e-commerce, it is important to appreciate the dynamism of the subject and thus its continual change. According to Koh and Maguire (2004), there are a wide range of internet applications that SMEs have at their disposal. However, whether they are actually using them fully to gain competitive advantage is not clear. Lack of resources and skill in both the technical and the business areas makes the introduction of e-business unworkable in its current format.

Koh and Maguire (2004) noted that changes in technology with their impact on the numbers and skills of the workforce pose a major challenge for most organisations. Small organisations find it difficult to justify a substantial financial commitment in an area they do not recognise as being their core element of the business. Simpson and Docherty (2004) found that ignorance surrounding technology is fuelling concerns about security, costs and legislation. They also found that in Australian SMEs barriers to taking advantage of the internet were lack of skills, knowledge and poorly trained staff. According to Lawson et al. (2003), diffusion of new technology can take decades, and involves more than simply reproducing and distributing the technology. Indeed making full use of the new technologies will rely on the IT skills of staff within organisations.

Taylor and Murphy (2004) found that many SMEs lack the necessary IT skill base to engage with the digital economy. Some may have IT enthusiasts as owner-managers, but the majority of firms do not. They noted that the lack of staff to implement IT is a separate aspect of this same deterrent. It may well be difficult or too expensive for an SME to hire people with the necessary technical expertise to pursue an IT strategy.

In their study, Blackburn and Athayde (2000) found that training of the labour force is regarded as a key component of Government competitiveness policy. They found that small firms often have difficulty finding training to suit their needs, and most owner managers undertake only limited external training and few expect to gain formal qualifications. Informal on-the-job training was also favoured over external training for employees. Training tended to be ad hoc and responsive to immediate and identifiable business needs. The main barrier to external training was the perception that it was both inconvenient and unnecessary (Blackburn and Athayde, 2000). However, the institutions expected to provide technical services to MSEs are weak and lack specialised capacity to meet the needs of the sector. There are no information networks between MSE operators and technology experts. The constraints limiting the availability and accessibility of relevant technology to MSEs are further compounded by the general low investment in research and development (Republic of Kenya Sessional Paper No. 2, 2005).
3 Research methodology

Cooper and Schindler (2001) defined a research design as the blueprint for fulfilling research objectives and answering questions. This research was carried out in the form of a descriptive design, which is defined as a study of discovery of associations among different variables (Cooper and Schindler, 2001). This design is feasible in business research where one seeks to establish if bivariate relationships between these variables may provide useful information. However, such correlative relationships do not necessarily imply a causal relationship. A descriptive design was, therefore, justified for this study as the researcher seeks to make inferences as what are the factors that influence the adoption and application of e-commerce in Kenyan SMEs.

3.1 Brief summary of SMEs in Kenya

In Kenya, the definitions used to describe the SME sector are based on employment size, which includes both paid and unpaid workers. A micro-enterprise is defined as having no more than ten workers, a small enterprise with between 11 and 50 employees whereas a medium enterprise with more than 50 employees (CBS, 1999). Farm enterprises are excluded from the definition of SMEs, except those farm enterprises that undertake some sort of processing before marketing. Thus, the term ‘small-and-medium enterprises’ covers the range of establishments, including informal economy activities that include one or more persons or enterprises in the formal economy employing up to 50 persons (Stevenson and St-Onge, 2005). The Ministry of Labour and Human Resource Development (MLHRD, 2002), which is the lead agency for the SME sector, makes provision for both formal and informal enterprises, classified into farm and non-farm categories, employing 1–50 employees (MLHRD, 2002).

According to CBS (1999), there were about 1.3 million MSEs in the country employing some 2.4 million people. Almost two-thirds of all MSEs are located in the rural areas, thus only one-third are found in the urban areas. Out of the total 1,289,012 MSEs in the country, Nairobi and Mombasa account for 204,280 of them; this is 15.8%. Compared with their population, Nairobi and Mombasa have a relatively high number of MSEs. Thus, compared with the other strata, the major urban areas have a higher density of MSEs per given population, as indicated in Table 1.

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Percentage of nat’l population</th>
<th>MSEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nairobi and Mombasa</td>
<td>9.7</td>
<td>204,280</td>
</tr>
<tr>
<td>Other major towns</td>
<td>6.2</td>
<td>157,533</td>
</tr>
<tr>
<td>Rural towns</td>
<td>2.1</td>
<td>81,320</td>
</tr>
<tr>
<td>Rural areas</td>
<td>82</td>
<td>845,879</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>1,289,012</td>
</tr>
</tbody>
</table>

Source: CBS (1999)
The National MSE Baseline survey in CBS (1999) shown in Table 2 found that close to two-thirds of the MSEs are in the trade sector. The dominance of trade is absolute in both urban and rural locations. The dominance of trade over the other sectors is not uncommon in many developing countries; though in some other countries, manufacturing sometimes dominates the scene due to relatively easier access to raw materials particularly in the rural areas.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>45,019</td>
<td>13.4</td>
</tr>
<tr>
<td>Trade</td>
<td>273,738</td>
<td>64.1</td>
</tr>
<tr>
<td>Bars, hotels/restaurants</td>
<td>24,888</td>
<td>6.0</td>
</tr>
<tr>
<td>Services</td>
<td>92,937</td>
<td>14.8</td>
</tr>
<tr>
<td>Construction</td>
<td>6,551</td>
<td>1.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>443,133</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: CBS (1999)

3.2 Data collection methods

The study used judgemental sampling, which is a non-probability restricted sampling technique. Cooper and Schindler (2001) defined judgement sampling as when a researcher selects sample members to conform to some certain criterion. The criterion that the researcher used is that the sample should have retailed MSME operating in Nairobi, who had between 1 and 100 employees. The primary data was collected through the use of a questionnaire, which was developed and organised on the basis of the research objectives. It constituted both open and closed-ended questions. The questionnaire was sub-divided into several sections as follows: general information, e-commerce applications, and factors affecting the use of e-commerce, which are broken down into knowledge of benefits derived from e-commerce, infrastructure, cost of e-commerce implementation and IT skills and training. The questionnaire used a 5-point Likert scale question to ensure that researcher collected nominal, ordinal and interval data, which were useful in the analysis techniques that were used.

4 Key findings

A total number of 100 questionnaires were distributed and the researcher collected 46 of them with the questions duly answered. Thirty questionnaires were returned blank, as respondents declined to answer any of the questions. Follow-up on the issue revealed that these respondents considered the information requested too confidential and were, therefore, not willing to share it. Since there are no e-commerce laws in Kenya that addresses the taxation aspect, they feared that the taxman may follow them. Twenty-four questionnaires for various reasons respondents failed to return them. The research, therefore, analysed the data based on the 46 questionnaires that were returned. From the data analysis, Figure 1 shows that out of the total respondents, over 50% of the SMEs use ICT and internet tools.
4.1 Knowledge of benefits derived from e-commerce

The range of responses was from strongly disagree to strongly agree using a 5-point Likert Scale style measure and the number of respondents were presented in percentages. Multiple regression analysis was carried out on the measures and an $R^2$ value of 0.068 shown in Table 3 was obtained for the measures of knowledge of e-commerce benefits. These results indicate that knowledge of e-commerce benefits influences 6.8% of the decision to adopt e-commerce tools.

Table 3  Regression model for knowledge of e-commerce benefits measures

<table>
<thead>
<tr>
<th>R</th>
<th>R Square</th>
<th>Adjusted R square</th>
<th>df1</th>
<th>df2</th>
<th>Sig. F change</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.261</td>
<td>0.068</td>
<td>-0.107</td>
<td>6</td>
<td>32</td>
<td>0.8805</td>
</tr>
</tbody>
</table>

The ANOVA results shown in Table 4 indicates a significance level of 0.881, which implies that the perceived benefits of e-commerce contribute little to the decision to adopt e-commerce in the business. From the results derived during the analysis, the relationship between knowledge of e-commerce adoption benefits and e-commerce is very minimal. This may largely be due in part to the fact that many of the respondents did not perceive any benefits, or did not know of the actual benefits that can be derived from e-commerce use.

Table 4  ANOVA measures for knowledge of e-commerce benefits measures

<table>
<thead>
<tr>
<th>Anova$^a$</th>
<th>Sum of squares</th>
<th>df</th>
<th>Mean square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Regression</td>
<td>0.642</td>
<td>6</td>
<td>0.107</td>
<td>0.389</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>8.794</td>
<td>32</td>
<td>0.275</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>9.436</td>
<td>38</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$^a$Predictors: (Constant), know custoemers will encourage others, know business will operate more effeciently, know sales volume will increase, know business costs will reduce, know customer satisfaction will improve, know new customes will increase.

$^b$Dependent variable: Use of IT or internet tools.
4.2 Infrastructure influence in e-commerce adoption

Among the respondents, 41.3% indicated that they have access to computer technology, while 34.8% indicated that they had access to the internet and 19.6% indicated that they had their own business website. Multiple regression analysis was carried out on the measures and an $R^2$ value of 0.245 shown in Table 5 was obtained for the measures of infrastructure. This figure indicates that infrastructure influences only about 25% of the decision to adopt e-commerce tools.

Table 5  Regression model summary for infrastructure measures

<table>
<thead>
<tr>
<th>$R$</th>
<th>$R^2$</th>
<th>Adjusted $R^2$</th>
<th>df1</th>
<th>df2</th>
<th>Sig. F change</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.4954</td>
<td>0.2454</td>
<td>0.0423</td>
<td>7</td>
<td>26</td>
<td>0.3334</td>
</tr>
</tbody>
</table>

The ANOVA results shown in Table 6 presents a significance level of 0.333, which indicates that the infrastructure variables do not greatly influence the decision to adopt e-commerce and the relationship between the two may be as a result of other circumstances.

The results indicated the influence infrastructure has on the adoption of e-commerce in Kenya’s SMEs is not very significant. However, the beta results indicated that access to computer technology and assured internet security are positively correlated or related to the adoption of e-commerce amongst Kenyan SMEs. The relationship between adoption of e-commerce and the levels of infrastructure in Kenya may, therefore, not be directly related.

Table 6  ANOVA results for infrastructure measures

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of squares</th>
<th>df</th>
<th>Mean square</th>
<th>$F$</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>2.057</td>
<td>7</td>
<td>0.294</td>
<td>1.208</td>
<td>0.333a</td>
</tr>
<tr>
<td>Residual</td>
<td>6.325</td>
<td>26</td>
<td>0.243</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>8.382</td>
<td>33</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

aPredictors: (Constant), Telephone line for internet use, Have a business website, Computer software, Reliable ISP, Access to computer technology, Assured internet security, Connected to the internet.

bDependent variable: Use of IT or internet tools.

4.3 Cost of e-commerce implementation relationship to its adoption

Multiple regression analysis was carried out on the measures and an $R^2$ value of 0.339 shown in Table 7 was obtained for the measures of cost of e-commerce implementation. This figure indicates that cost of e-commerce implementation influences only about 33.9% of the decision to adopt e-commerce tools.
The ANOVA results shown in Table 8 present a significance level of 0.096, which indicates that costs incurred with the implementation of e-commerce influence the decision as to whether to adopt or not to adopt e-commerce tools. It should be noted that the significance level is not very high; hence, other circumstances may contribute to the decision to adopt or not adopt e-commerce.

The coefficient results indicate a positive relationship between costs of e-commerce implementation and the actual e-commerce adoption. This would imply that the managers take into consideration the cost implications to the business before they embark on e-commerce adoption.

4.4 Technical skills and IT knowledge relationship with adoption of e-commerce

Multiple regression analysis was carried out on the measures and an \( R^2 \) value of 0.710 was obtained for the measures of IT skills and training. Table 9 indicates that IT skills and training influences 71.0% of the decision to adopt e-commerce tools.

From the significance level figure in the shown in the ANOVA Table 10, Technical skills and IT knowledge variables, in general, have some level of significance, to the adoption of e-commerce.
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Table 10  ANOVA results for IT skills and training measures

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of squares</th>
<th>df</th>
<th>Mean square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>4.012</td>
<td>9</td>
<td>0.446</td>
<td>3.534</td>
<td>0.020*</td>
</tr>
<tr>
<td>Residual</td>
<td>1.640</td>
<td>13</td>
<td>0.126</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>5.652</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Predictors: (Constant), employees regularly attend workshops, Manager knows how to use the internet, regularly attend workshops, employees know how to use the internet, trained in IT, know website maintenance, know how to use computer software, employees are knowledgeable in IT, employees know website maintenance.

From the coefficient results, the manager’s skills and training in IT contribute to the relationship between IT skills and the adoption of e-commerce tools. The regression results indicated that IT skills contribute to 71% of the decision to adopt e-commerce. This would imply that a lack of these skills would result in reduced adoption levels of e-commerce.

4.5 Correlation between measures of variables

The research sought to find if there exists a correlation between the different measures used for the variables amongst themselves. Using Kendall’s tau-b and Spearman’s correlation measures, significance was determined at the 0.05 and 0.01 levels using two-tailed analysis. The results indicate that the managers’ knowledge of the use of internet, training in IT and knowledge of computer software were very significant in the decision to adopt e-commerce. These three variables indicated the highest significance among the variables tested.

5 Discussions, conclusions and recommendations

The following discussion is on the research findings from the study. These were presented as four issues that were under investigation:

i  knowledge of benefits derived from e-commerce
ii  infrastructure
iii  cost of e-commerce implementation
iv  technical skills and IT knowledge amongst owners and employees.

5.1 Knowledge of benefits derived from e-commerce

The research findings were consistent with those of Cloete et al. (2005) who found that despite these potential benefits of e-commerce to an SME, there seems to be a perception by owners of SMEs that there is a lack of business benefit, if the input is weighed against immediate returns. Due to the fact that the ownership and decision-making power in an
SME is held by just one or two people, adoption of e-commerce into such an organisation is heavily reliant on these people’s acceptance of a technology. From the study, it emerged that many SME owners though aware that there are some benefits to adopting e-commerce, they did not perceive any real benefits. As such, it may be concluded that within the current framework and attitudes adopted by respondents, knowledge of benefits derived from adoption of e-commerce does not play a significant role in their decision to adopt or not to adopt e-commerce tools.

5.2 Infrastructure influence in adoption of e-commerce
The study found that lack of knowledge and information about technological advances was a limiting factor in MSMEs adoption of e-commerce tools. These findings were consistent with Kaynak et al. (2005) who found that until recently, most emerging country markets in Africa, the Middle East, and certain parts of Asia were unable or reluctant to infuse e-commerce into their business processes. The slow development of e-commerce in these countries may be explained by the lack of necessary physical infrastructure (for example lower personnel computer penetration, poor telecommunication infrastructure as most of these countries possess analogue systems as opposed to digital systems of developed Western countries, and inefficiently managed telecommunication systems) as well as supportive institutional environment that facilitates the building of transactional integrity. During the study, results indicated that the current levels of infrastructure do not influence highly the decision to adopt e-commerce tools. As such, it may be implied that the infrastructure to adopt exists, but other circumstances are preventing the increase in adoption. Respondents were aware of what existed in terms of infrastructure, but their decisions were not greatly influenced by this.

5.3 Cost of e-commerce implementation
The findings indicate that cost of computer support, subscription to internet and cost of purchasing computer software influence the relationship between the cost of e-commerce implementation and e-commerce adoption. Subba et al. (2003) has argued that while the cost of software and hardware has significantly decreased in recent years, it remains significant for certain types of businesses. The results of this study from the linear regression model indicated a positive relationship between costs of e-commerce implementation and the actual e-commerce adoption with a positive $R^2$ of 0.3390, which makes us conclude that the cost of e-commerce influences the adoption of e-commerce in Kenya’s SMEs.

5.4 Technical skills and IT knowledge amongst owners and employees
The researchers found that from the coefficient results, the manager’s skills and training in IT contribute to the relationship between IT skills and the adoption of e-commerce tools. The regression results indicated that IT skills contribute to 71% of the decision to adopt e-commerce. This agrees with Koh and Maguire (2004), where they stated that there are a wide range of internet applications that SMEs have at their disposal. Yet, the lack of resources and skill in both the technical and the business areas makes the introduction of e-business unworkable in its current format. We can, therefore, conclude
that the level of technical skills and IT knowledge amongst owners and employees influences the adoption of SMEs in Kenya.

5.5 Recommendations for further research

Suggested areas for further research are the impact of Government ICT policies on e-commerce adoption in MSMEs in Kenya and the perception of business growth in MSMEs. Also suggested would be the impact of zero-rating on computer components on the uptake of computer usage among SMEs. Research should be conducted on the viability and benefits of large enterprise and SME partnerships in terms of transfer of technology and information. This would include the benefits that can be derived from such partnerships, and their impact on the growth of the industry and economy.

References


