

Antecedents to Successful Adoption of e-Procurement in Textile and Apparel Firms in Kenya

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ABSTRACT-This study examined the factors that affect implementation of e-procurement within the textile and apparel firms in Kenya. Specifically it sought to investigate the effect of organizational issues, environmental factors and technological factors on the implementation of e-Procurement. A survey approach was employed, using a stratified random sampling to ensure representativeness. Both quantitative and qualitative methods of data analysis were used. Descriptive statistics as well as regression analysis were used to facilitate examination of the relationship between the variables of interest. The study findings indicate that environmental factors have the most influence on e-procurement implementation, followed by technological and organizational factors respectively. The study points out that management support, employee empowerment, policy strengthening in ICT use are key to effective e-procurement implementation and therefore should be given due attention.

Key words: e-procurement, implementation, organizational factors, environmental factors, technological factors



Introduction

1.1 E-Procurement

The importance of proper management of procurement is highlighted by the fact that it account for substantial portion of firm's resources and time [27]. In such a highly competitive environment nowadays, it is necessary for every firm to maintain an efficient and effective procurement to cut administration cost and to keep abreast of the market condition to procure material and services at the right price, quality and time. Traditionally, firms use paper based system to procure materials and services by searching for material from paper based catalog provided by suppliers through telephone and fax. The traditional material procurement process involves generation, copying and transfer of many paper documents [14].

Over the last few years, the internet has evolved from being a scientific network only, to a platform that is enabling a new generation of business [14]. The internet is changing the way business is done in every industry. The World Wide Web has become a source for information, goods and services [16]. E-procurement has emerged as one of the most discussed topic in material procurement. Without doubt, it will dramatically change the way purchasing is done in the near future [9]

Electronic procurement (E-procurement) is the application of Internet technology in material and service procurement. It involves the use of various forms of Information

Technology (IT) to automate and streamline the procurement process, improving efficiency and transparency, thereby reducing the cost of operation within and between business parties [6]. Even given the potential benefits of e-procurement, many organizations especially within the developing economies have not effectively embraced the practice. In Kenya a wide range of organizations are struggling to adopt information and communication technology in their procurement functions despite proven benefits [19]. This study set out to examine the factors affecting implementation of e-procurement by textile and apparel firms in Kenya.

According to Mitra, Laka and Abdulla, (2000), the most common forms of e-commerce in the Kenya market are e-procurement, eBanking and of late embanking. Of the three, e-procurement which is a user friendly; Internet based purchasing system [28] has generated a lot of interest due to its ability in improving efficiency and transparency [6]. According to Kinyanjui and McCormick, (2002), only 33% of textile and apparel firms have implemented e-procurement as a strategy to improve services in Kenya. It would therefore be of importance to identify the underlying factors impeding textile and apparel firms in Kenya from integrating their procurement activities electronically so that they can achieve the full benefit of e-commerce.

1.2 Textile and apparel firms in Kenya

The manufacturing sector in Kenya in 2004 accounted for over 20 percent of the country's Gross Domestic Product

(GDP), provided employment opportunities to about 300,000 people in the formal and 3.7 million persons in the informal sectors of the economy. The textile sub-sector constitutes an important component of the manufacturing sector in the country. It is one of the key sub-sectors targeted under the country's strategy for economic recovery [42]

The textile and apparel industry in Kenya faces significant crises from cheap imports, and the elimination of quotas as a result of the expiry of the Agreement on Textiles and Clothes (ATC), exposing the country to stiff competition on third markets from more established manufacturing economies such as China. Consequently, a number of firms' closures and layoffs have been reported in the country's textile industry. This made the government to shift to an outward development strategy which has led to the emergence of Export Processing Zones (EPZs), [43]. The EPZs have enjoyed from the enormous market prospects presented by the tariff and quota advantages granted under the US-led African Growth Opportunity Act (AGOA) and the African, Caribbean and Pacific-European Union (ACP-EU) Cotonou Agreement [8]. These two markets have brought fresh hope in the textile and apparel industry which if supported by the adoption of e-business can result in sustainable growth.

2. Theoretical background

2.1 Potential benefits of e-procurement

A growing number of organizations are adopting e-procurement as part of their management strategy to gain competitive advantage over their competitors and achieve increased profitability. One way of achieving this is by centralizing functions such as procurement and logistics in a single function [32] as electronic systems of procurement do not have geographical, departmental and time barriers. Kalakota, Tapscott and Robinson [18] note that adoption of e-procurement "allows procurement activities 24 hours a day, 7 days a week, and 365 days a year". As a centralized department can oversee all procurement activities and different offices/departments can access the same documentation when required, this gives a distinct advantage over the much slower process of having to post documentation between offices/departments. This improvement in competitiveness is further highlighted by [39] who argue that gaining competitive advantage, reducing procurement costs, and increased efficiency and profitability are seen as some of the most important drivers and benefits of e-procurement adoption. Rankin, Chen and Christian [32] show that e-procurement results in increased productivity and greater market access.

2.2 Factors influencing successful adoption of e-procurement

2.2.1 Organizational Factors and E-procurement Implementation

The characteristics in the organizational context seem to be the primary focus of many studies in the context of business organizations [30]. Top management support, firm's size, skills and knowledge and organization policy are considered to be factors that influence firms' willingness to adopt of E-procurement. Jeyaraj et al. [17] found that top management support to be one of the best predictors of organizational adoption of IS innovations. Top management can stimulate change by communicating and reinforcing values through an articulated vision for the organisation [36]. Top management support is critical for creating a supportive climate for the adoption of new technologies [31], [13].

Budgetary allocation is defined as "the availability of the needed budgets for adoption of e-procurement" [15] indeed, economic costs, lack of technical knowledge and organization policy are perceived as three of the most important factors that hinder Information System (IS) growth in many organizations [4]. Budgetary allocation express an organization's capital available for IS investment [2]. Dholakia & Kshetri [7] suggested that skills and knowledge of employees influence the future adoption of a new technology in a large extent.

Organizational size has been identified by [17] as one of the best predictors of organizational adoption of IS innovations. Goode and Stevens [11] study shows that business size, previously the best indicator of technology adoption, was not significantly related to IS innovations' adoption. However, the typical argument is that larger firms have a greater need, resources, skills and experience and the ability to survive failures than smaller firms [24]. It can be argued that larger firms are more likely to adopt E-procurement System (EPS) than smaller firms. Thus, we propose the following hypothesis:

H1: There is a positive relationship between organizational factors and the implementation of e-procurement.

2.2.2. Environmental Factors and E-procurement Implementation

Supplier support /commitment, government policy and regulations, competitive pressure and external IS support are considered to be factors that influence Firms' willingness to adopt E-procurement Systems (EPS). It has been argued that competition pressure influences the adoption of IS innovations [24]. Firms that face stiff competition in pricing, market size and market leadership are likely to turn to automation as a way of achieving competitive edge in terms of price leadership, efficiency, market scope and flexibility in business processes [11]. Therefore, competitive pressure has been identified by [17] as one of the best predictors of organizational adoption of IS innovations. Competition in the adopter's industry is

generally perceived to positively influence the adoption of IS innovations [10].

External IS support refers to the availability of support for implementing and using IS innovations [31]. External IS support has not only been found to be an important determinant of IS success [5], but also perceived to be positively related to IS innovations' adoption [31]. With the popularity of outsourcing and the growth in third party support, firms are more willing to adopt new IS innovations if they feel there is adequate vendor or third party support it [31].

A firm's EPS adoption decision may also be influenced by how ready its trading partners along the value chain adopt an EPS, since, for an electronic trade to take place, it is necessary that all trading partners adopt compatible electronic trading systems and provide Internet-enabled services for each other. Furthermore, EPSs may be more appropriate when there is a tight integration with suppliers' systems, which goes beyond the walls of an individual organization [40]. Conversely, a lack of trading partner readiness may hinder EPS adoption. According to [40], government policy and regulations are known major facilitators of EPS adoption through subsidies and trading policies. Thus, we propose the following hypothesis:

H2: There is a positive relationship between environmental factors and e-procurement implementation.

2.2.3. Technological Factors and E-procurement Implementation

In the existing literature, technological resources have been consistently identified as an important factor for successful information systems adoption, [22] and [12]. Hence, this study puts forward technology as an adoption driver, which according to [33], encapsulates IT infrastructure, information security risks and rapid changes of technology. Premkumar [30] argues that there are very few studies that have examined the impact of technological characteristics in the context of manufacturing businesses.

IT infrastructure meant the hardware, software, and all, the related network which enables both forward and backward linkages of the IT systems [33]. Premkumar [30] found IT infrastructure to be an important determinant of IS adoption. The adoption of new technologies can bring significant changes to the work practices of businesses and resistance to change is a normal organizational reaction, [31]. Therefore, it is important, especially for businesses, that the changes are compatible with its infrastructure, values and beliefs.

Information security risk may be defined as any possible threat that uses vulnerability in the system of an organization to cause disruption to the organizational routines and processes in some or the other form, [33]. Information Security risks may also be classified as threats

that lead to a loss of any form to an individual or an organization. Such losses may include loss of privacy, identity theft, financial loss, negative impact on customer relations, loss or damage of confidential data or information, or a loss in profitability. Information security risk is a big challenge for any company or organization that deals with permanent or temporary storage or transfer of information. The complexity of the Information security risk management creates greater uncertainty for successful e-procurement implementation and therefore increases the risk in the adoption decision, [31]. This factor has been perceived to be negatively associated with adoption of IS innovations [13], [3].

Rapid and revolutionary changes in technology have created an increasingly information-centric global economy, where knowledge has become a key factor in competitiveness. The challenge for many firms today is how to adopt an IT system that can withstand these rapid and revolutionary changes [33]. Rapid changes in technology are defined as "changes that happen suddenly, and that it is difficult to predict how such a new technology would operate. IS innovations that have been seen to withstand the impact of rapid changes in technology in the industry in which a firm operates is more likely to be viewed in a favorable light. Thus, we propose the following hypothesis:

H3: Technological factors positively and significantly do influence e-procurement implementation.

2.3. Hypothetical model

The hypotheses presented in the previous section lead us to a theoretical model described in Fig. 1. E-procurement implementation factors are broadly congregated into three constructs of organization, environment and technological factors. The relationship between each constructs to e-procurement is thus conceptualized as below.

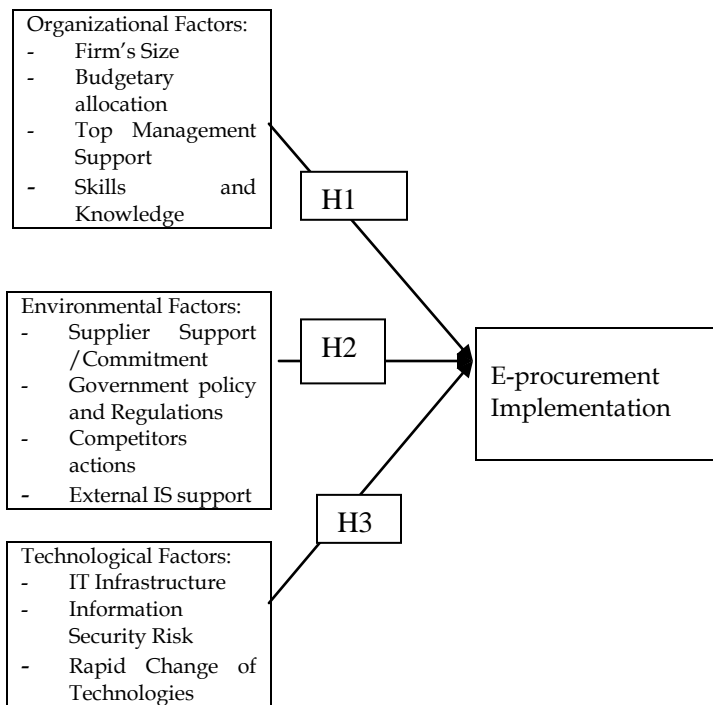


Figure 2.1: Factors affecting implementation of e-procurement (adapted from Naseebullah, 2010)

3. Research methodology

3.1 Research Design

A survey research design was employed in this study. The survey research design is a very valuable tool for assessing opinions and trends. Therefore this design was chosen due to its ability to describe large population and generalizability of the findings.

3.2 Study Population

Saunders, Lewis and Thornhill [41] and Kothari [20], all described a population as the total collection of elements about which one wish to make inferences. The target population refers to the entire group of individuals or objects to which a researcher is interested in generalizing the conclusions. The study population is the accessible population in which the researcher can apply the conclusions, [35]. For purposes of this study the target and study population consisted of all the sixty eight (68) textile and apparel firms registered as members of the Kenya Association of Manufacturers (KAM) as at Jan, 2011.

3.3 Sampling Technique and Sample Size

The sampling technique used in this study was stratified random sampling approach so as to take care of all categories (Chapters) of the textile and apparel firms listed as members of the KAM. In a stratified random sampling approach, the population was divided into five relevant and significant strata based on region (Chapter) of their

operations as an attribute. For example, the population of this study was first divided into disjoint groups of Coast, Eldoret, Nairobi and Surrounding, Nakuru and Nyanza/Western units, respectively. These subgroups, called strata, together they compromise the whole population, so that $N_1+N_2+...+N_L=N$. From each stratum, a sample, of pre-specified size, was drawn independently using simple random sampling table in different strata.

According to Lenth, (2001), the sample size should be of adequate size, relative to the goals of the study. This research used the sample size formula developed by [44] to calculate the sample size of 58 firms selected in a population of 68 firms at a confidence level of 95% and a precision or error of 5%.

3.4 Data Collection Instrument and procedure

A research questionnaire was used as the main instrument for data collection. The questionnaire was structured to provide for open and closed ended questions. The structure of the questionnaire comprised of four parts, the first part constituted the particulars of respondent, the second part had questions on general information, the third part had questions about the e-procurement implementation status and lastly the fourth part focused on key considerations on e-procurement implementation. The questionnaire had been developed on the basis of research hypothesis and was self-administered by the researchers through hand delivery, courier and e-mail.

3.5 Data Analysis Methods

This study used the quantitative and qualitative methods of data analysis. To facilitate the analysis, the questionnaires were coded according to each variable of the study to ensure accuracy and minimal error margin during analysis. Descriptive statistics such as mean and standard deviation were used to describe the basic features of the data and to provide simple summaries about the sample and the measures. Together with simple graphics analysis, they form the basis of virtually every quantitative analysis of data [37]. Data analysis was facilitated by Statistical Package for Social Sciences (SPSS) program version 18 which has Automated Data Preparation feature (ADPF), can provide multiple comparisons and allows table customization. Regression analysis was further used to show the relationship between the dependent variable and the independent variables [21]. The data was presented using tables and charts to give a clear picture of the research findings at a glance.

3.6 Validity and reliability tests of constructs

The Cronbach's Alpha Test of Reliability was used to test the reliability of the constructs describing the variables of the study and the results were as follows: E-Procurement Implementation had an alpha score of 0.6253, Environmental Factors, Organizational Factors and

Technological Factors had an alpha score of 0.6232, 0.6200 and 0.6079 respectively. Applying this test specifies whether the items pertaining to each dimension are internally consistent and whether they can be used to measure the same construct. According to Nunnally and Bernstein (1994) a-score exceeding 0.7 indicates high internal reliability of the scale items. The attained alpha scores imply acceptable level of reliability of the measures. The table 3.1 below shows the reliability test results based on the pilot data.

Table 3.1: Reliability Test Results

Variable	Cronbach Alpha (α -score)	No. of Items
E-Procurement Implementation	0.6253	7
Environmental Factors	0.6232	5
Organizational Factors	0.6200	4
Technological Factors	0.6079	3
Overall	0.6191	19

4. Results

4.1 Level of e-procurement adoption

The study established that 31% of the studied firms rely on old records in selecting their suppliers while 69% search through internet catalogue in selecting suppliers. Therefore it can be said that most firms use technology in selecting suppliers, that is, they have implemented some form of e-procurement in their procurement activities. The findings further indicate that 33% of the firms use telephone as a way of communication while majority of the respondents, i.e. 67% use e-mails as a way of communicating with the suppliers. The results indicate that majority of the respondents were oriented towards information technology and impliedly are aware of the advantages of the information communication technology. There is likelihood of these firms moving towards e-procurement implementation since they already have the platform. The study established that 15% of the firms use mails to issue local purchase orders to their suppliers, 69% used e-mail while 15% of the respondents used fax to issue purchase orders. Thus, the results show that a majority of the firms were in touch with information technology and are more likely to implement e-procurement system in their firms.

4.2 Organizational factors and implementation of e-procurement

The study first objective was to investigate the effect of organizational factors on the implementation of e-procurement in the textile and apparel sector in Kenya. To address this effectively, the organizational factors existent were established and thereafter their influence on e-procurement implementation examined. The respondents

were asked to identify from the following organizational factors; firm's size, budgetary allocation, top management support, skills and knowledge and others which ones affect the implementation of e-procurement in their firms. The findings were as follows: 17% of the respondents identified firm size, 30% budgetary allocation, 13% top management support, 27% skills and knowledge while 13% depended on other factors.

4.2.1 Effect of organizational factors on E-Procurement implementation

The respondents were asked to rate the effect of organizational factors on e-procurement implementation on a likert scale of 1 to 5 scores where 1 represents least effect and 5 represent most effect. The findings indicate that budgetary allocation has the most effect on implementation of E-procurement with a mean score of 4.07 and a variability in agreement of a Standard Deviation (SD) of 1.087. This confirms the findings by [4] that budgetary allocation plays a major role in the adoption of any new technology. It was followed by top management support with a mean of 3.87 and a SD of 1.361). This finding is also in tandem with that of [17] that top management support to be one of the better predictors of organizational adoption of IS innovations. The findings also indicate that organization policy with a mean of 3.59 and a variability of agreement of a SD of 1.417 is also considered moderately important on e-procurement implementation. This finding re-enforces the view of [15] which perceived organisation policy as one of the three important factors in information systems implementation. The firm's size (mean 3.29, SD 1.643) and the skills and knowledge of the employees (mean 2.62, SD 1.583) were found to be the least important factors on e-procurement implementation. The former contradicts the findings by [17], that perceived organization size as one of the best predictors of organization adaption of IS innovations. It however supports [11], which showed that business size was not significantly related to IS innovation adoption. The latter contradicts the suggestion by [7] that skills and knowledge influence the adoption of new technology in a large extent.

4.2.2 Regression analysis result on organizational factors and e-procurement implementation

Regression (R) analysis was run to establish the strength of the relationship between the organizational factors and the e-procurement implementation. The R result implied that organizational factors are least related to e-procurement implementation with an R of 0.727. Our hypothesis that there is a relationship between organizational factors and implementation of e-procurement thus stands true.

4.3 Environmental Factors and e-procurement implementation

In investigating the effect of environmental factors on the implementation of e-procurement, first the environmental factors existent were established and thereafter their influence on e-procurement implementation examined. The respondents were asked to identify from the following environmental factors; supplier support /commitment, government policy and regulations, competitors actions (Usage of technology) and external IS support which ones affect the implementation of e-procurement in their firms. The findings reveal that of the firms studied, 30% indicated that government policy and regulations are the most critical issues in e-procurement implementation, while those identifying external information system, supplier support and commitment and the competitor's actions were 27%, 17% and 13% respectively.

4.3.1 Effect of Environmental Factors on E-Procurement Implementation

The respondents were asked to rate the effect of environmental factors on e-procurement implementation on a likert type scale of 1 to 5 scores where 1 represents least effect and 5 represent most effect. Majority of the respondents indicated that government policy and regulations with a mean score of 4.21 and a SD of 0.991 indicating the spread about the mean, has the most effect on the implementation of E-procurement. This finding is in line with the view of [40] that government policy and regulations were major facilitators of EPS adoption through subsidies and trading policies. It was followed by external information system (IS) support with a mean score of 3.90 and a SD 1.048 showing the variation of the responses about the mean. This finding confirms the study by [5] which perceived external IS support to be positively related to IS innovations' adoption. Firms are more willing to adopt new IS innovations if they feel there is adequate vendor or third party to support it [31]. In the third place which was considered to be of moderate effect was Supplier Support and Commitment with a mean score of 3.74, and a SD of 1.202. For an electronic trade to take place, it is necessary that all trading partners adopt compatible electronic trading systems and provide internet enabled services for each other [40]. And lastly, the one with the least effect on implementation of e-procurement was the competitor's actions with a mean score of 3.64, and a SD of 1.236. This confirms the findings by [10] which found competitor's actions to generally influence the adoption of e-procurement. Also, this is in contrast to [17] study in Malaysia which found out that competitive pressure to be best predictors of organizational adoption of IS innovations. This may be due to technological gap between the two countries. Whereas Malaysia has taken technology as the driver of their competitive advantages, Kenya is still

at the adoption stage of the technologies hence the least influence in the findings.

The respondent was asked to state in their opinion what need to be done to ensure business environment facilitates implementation of e-procurement. Majority recommended formation of partnership with vendors to facilitate integration among trading partners (mean 3.90, SD 1.499). They also recommended that the government should form a policy to support the use of ICT in businesses (mean 3.60, SD 1.545).

4.3.2 Regression result on environmental factors and e-procurement implementation

Regression (R) analysis was run to establish the strength of the relationship between the environmental factors and the e-procurement implementation. From the result, environmental factors and the e-procurement implementation are the most linear related with an R of 0.989. This result confirms our hypothesis that "environmental factors are positively related to e-procurement implementation".

4.4 Technological Factors

The study third objective was to investigate the effect of technological factors on the implementation of e-procurement in the textile and apparel sector in Kenya. To address this effectively, the organizational factors existent were established and thereafter their influence on e-procurement implementation examined. The respondents were asked to identify from the following technological factors; IT infrastructure, information security risk and rapid change of Technologies which ones affect the implementation of e-procurement in their firms. The findings were; the majority (50%) indicated that information security risk, followed by rapid change of technologies (28%) and IT Infrastructure (22%) respectively.

4.4.1 Effect of Technological Factors on E-Procurement Implementation

The respondents were asked to rate the effect of technological factors on e-procurement implementation on a likert scale of 1 to 5 scores where 1 represents least effect and 5 represent most effect. The findings illustrate that majority of the respondents indicated that information security risk with a mean score of 4.09 and a SD of 1.339 indicating the variation of the scores around the mean, has the most effect on implementation of E-procurement. This confirms the findings by Suoranta and Thornhill, [41], that security is perceived as a major driver in the implementation of technology. This was followed by IT Infrastructure (mean 3.77, SD 1.459) and the one with the least effect was change of technologies (mean 3.53, SD. 0.996).

The respondents were also asked to comment on what they think should be done to ensure technological climate

facilitate implementation of e-procurement. Majority with a mean of 3.87, and a SD of 1.361 recommended improvement of IT infrastructure by the government which may indicate under development of the infrastructure in most parts of the country. They also recommended that IT systems should be flexible with a mean of 2.62 and that users should be trained on how to secure their systems by experts, 3.59. These may indicate that the respondents were concerned with the rapid change of technology and the information security risk respectively.

4.4.2 Regression result on technological factors and e-procurement implementation

Regression (R) analysis was run to establish the strength of the relationship between the technological factors and the e-procurement implementation. From the result, technological factors and the e-procurement implementation are linear related with an R of 0.873. This result confirms our hypothesis that "technological factors are positively related to e-procurement implementation".

5. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

The study established a linear relationship between organizational factors and e-procurement implementation in the following areas; firm size, budgetary allocation, top management support, and skills and knowledge. However, the relationship is the least compared to others factors under the study. Organization factors (Firm's Size, Budgetary allocation, Top Management Support and Skills and Knowledge) have a weak linear relationship with e-procurement implementation compare to environmental and technological factors. The study also established under the organizational factors that firm size and the skills and knowledge of the employees had the least effect on implementation of e-procurement.

The study established that environmental factors are the most linear related with the e-procurement implementation in the following areas; supplier support /commitment, government policy and regulations, competitor's actions (usage of technology) and external IS support. The study also found that government policy and regulations play key role in the implementation of E-procurement systems. The study further established a linear relation between technological factors and e-procurement implementation in the following areas; IT infrastructure, rapid change of technologies and information security risk. Respondents across were in agreement that information security risk played a key role in the implementation of E-procurement.

5.2 Conclusion

On the e-procurement implementation, the study concludes that it is most affected by the environmental factors

followed by technological and least affected by organizational factors. The study also concludes that there has been some form of e-procurement implementation in textile and apparel sector as evident through aspects such as sourcing through e-catalogue, internet search, application of ERPs and using e-mails for ordering.

5.3 Recommendations

Based on the study findings the following recommendations are made. Lack of top management support, limited skills and knowledge of IT and lack of funds were some the issues that came out as working against the embracement of e-procurement by the textile and apparel firms in Kenya. Top management support, training and re-skilling of employees together with budgetary allocation issues should be emphasized. Close attention of these issues is likely to improve the level on intake of e-procurement by the textile and apparel firms in Kenya.

On lack of vendors support and in adequate government policy to support the use of ICT in businesses the study recommends the formation of partnership with vendors to facilitate integration among trading partners and the government should form a policy to support the use of ICT in businesses. These may increase the speed and the level of e-procurement implementation in the textile and apparel sector in Kenya.

On limited IT infrastructure, instability of IT systems and information security risks concerns, the study recommends that the government should direct efforts towards improving the IT infrastructure coverage such as fiber optics, telephone lines, and satellite disks. The IT systems should be made flexible enough to adapt to changes in technologies and the users should be trained on how to secure their systems so that their level of trust in ICT can be improved.

5.4 Suggestions for Further Studies

Future studies are suggested on the following areas: target specific factors' effect on e-procurement implementations for insight analysis and the implication of e-procurement on firm and procurement performance.

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