

The Adoption of Information and Communication Technology by Small Enterprises in Thika Municipality, Kenya

Samuel Obino Mokaya

Jomo Kenyatta University of Agriculture and Technology
P. O. Box 62000-00200, Nairobi
Kenya

Abstract

Information and communications technology (ICT) has assumed a critical role in facilitating socio-economic development in many countries. The contribution of ICT to enterprise development has been recognized and many countries including Kenya have made deliberate efforts in integrating ICT into small enterprise (SE) development agenda. However, the adoption and use of ICT by small enterprises has been below expectations. The study sought to determine factors affecting the adoption and use of ICT by small enterprises Kenya. The study was conducted through a survey questionnaire covering a stratified sample of 78 respondents drawn from 390 SEs in Thika Municipality. Both qualitative and quantitative methods were used to analyze data. Chi-square tests were conducted to establish the relationship between variables under study. The study revealed that most SEs use basic communication tools such as cell phone; text and voice (75%), and internet (34.6%). Adoption and use of ICT tools has not been well embraced by SEs. Most small enterprises operate on hand-to-mouth financial existence and therefore, have a weak financial capacity. The results indicate a statistically significant relationship between financial capacity and ICT adoption with a chi-square value of 7.890 at 0.049 significance level. Small enterprise operators perceive the cost of ICT to be very high, with a negative effect on adoption. Communication infrastructure was also found to have a significant effect on adoption with a chi-square value of 21.65 at 0.001 significance level. The level of education and knowledge has significant effect on adoption having a test value of 16.063 at 0.013 significance level. The study concludes that ICT has not been well embraced by SEs in Kenya. All the variables under study have a statistically significant effect on ICT adoption. The Government of Kenya should develop an appropriate programme to encourage ICT adoption by SEs, eliminate all taxes on ICT, establish a special fund to support ICT adoption; support training programmes to develop the capacity of SEs to embrace ICT; invest in appropriate communication infrastructure for SEs, and the SE Federation should institute deliberate efforts to encourage SEs to invest in basic ICT tools to help improve their business and make them more competitive. Such efforts could include establishment of a special fund to finance ICT adoption by SEs.

Key Words: Information and communication technology, small enterprise, ICT adoption, infrastructure, hand-to-mouth financial regime, financial capacity, cost, knowledge level.

Background

Information and communications technologies (ICT) have assumed a central position in the development agenda of most countries due to their critical role in facilitating socio-economic development. Small enterprises have started using ICT relatively recently and they are generally characterized by inferior technology and management capabilities (Caldeira & Ward, 2002). The contribution of ICT to enterprise development has been widely recognized as part of the development agenda in many countries.

Small enterprises play a significant role in employment and wealth creation as well as poverty reduction. They also serve as seedbeds for medium and large scale entrepreneurs, contribute to more balanced socio-economic development and facilitate the process of adjustment in large enterprises; emerging as competent suppliers of products and services previously not available in the market place (Republic of Kenya, 2002). However, they operate in an environment characterized by fragmented and incomplete information where awareness of markets, technology, policy, regulations and finance is limited. This affects entrepreneurial activity since the absence of information impinges on the scope for discovery and exploitation of profitable opportunities. In the context of globalization, information is the basic requirement for enterprise creation, growth and survival; and ICT is capable of easing information gaps in the business sector.

ICT enhances SE efficiency, reduces costs, and broadens market reach, locally and globally; resulting in job creation, revenue generation and overall country competitiveness. Small enterprises are generally seen as being at a disadvantage to larger businesses. They are characterized by limited availability of resources in terms of time, money and expertise (Wymer & Regan, 2005). Their inferior technology and managerial capabilities have often shown to be a constraint on their effective use of new technologies (Caldeira and Ward, 2002). Whereas ICT is not a panacea for all development problems, it offers enormous opportunities to small enterprises. It will increasingly empower SEs to participate in the knowledge economy by facilitating connectivity; helping to create and deliver products and services on a global scale, and providing access to new markets and new sources of competitive advantage to boost income growth.

The Problem

The benefits of ICT adoption by small enterprises range from opportunity and market access to operational efficiencies and making enterprises more competitive and successful. Failure to adopt information and communications technologies has led to high cost of production and hence low profits. Business inter-linkages and networking is greatly hampered to the extent that entrepreneurs do not know about new products in the supply chain or even consumer demands, resulting in market mismatch between demand and supply. In effect, businesses continued to be operated in markets that are no longer profitable due to competitive pricing and hence business collapse. In the Kenyan situation, where small enterprises are the dominant economic operatives, ICT offers great potential for growth, profitability and competitiveness. As much as the Government of Kenya is committed to facilitate widespread use of ICT to support the growth of small enterprises, and boost e-business; the lack of knowledge on the status of ICT adoption by small enterprises and the barriers to adoption makes time ripe for a critical study. ICT adoption by small enterprises in Kenya has been below expectations and is of concern to policy makers, academia and development partners.

Purpose

The purpose of the study was to determine the factors that affect ICT adoption by small enterprises in Kenya; in an effort to making appropriate recommendations to improve access and use. Specifically the study sought to determine the effect of financial capacity; cost of ICT, infrastructure and knowledge level on adoption of ICT by small enterprises in Kenya

Methodology

The study was descriptive in nature, conducted through a survey questionnaire. It covered a stratified sample of 78 respondents drawn from a total population of 390 small enterprise operators in Thika Municipality, Kenya. Both qualitative and quantitative analysis tools were used. Qualitative data was analyzed logically and systematically by organizing data into categories; shaping it into information; interpreting and summarizing the information. Quantitative data was analyzed using measures of central tendency and Chi-square tests to determine the relationship between variables and their effects on ICT adoption by small enterprises in Kenya. The objective of the analysis was to make a prediction about the dependent variable (ICT adoption) based on its covariance with all the independent variables (the factors).

Results and Analysis

According to the study findings (Table 1), most proprietors of small enterprises have attained college level education (38.5%) and are therefore expected to be aware of ICT tools. Most business enterprises in Kenya use basic communication tools such as mobile (75%), internet (34.6%) and simple computer based programmes.

Table 1: ICT tools used in small enterprises

| Technology/ Gadget | Response | | | |
|--------------------|----------|------|-----|------|
| | No | | Yes | |
| | F | % | F | % |
| Mobile | 13 | 25.0 | 39 | 75.0 |
| Internet | 34 | 65.4 | 18 | 34.6 |
| Computer | 30 | 57.7 | 22 | 42.3 |
| Radio | 50 | 96.2 | 02 | 03.8 |
| Television | 50 | 96.2 | 02 | 03.8 |
| Calulator | 50 | 96.2 | 02 | 03.8 |

The access and use of ICT tools has not been well impressed by majority of the enterprises in Kenya. 26.9% of the respondents felt that their access to and use of ICT was very high. Approximately 15% of the respondents also felt that their access and use was high. However, more than 50% of the respondents reported average to very low access and use of ICT tools. The results are consistent with viewpoints by Levy, Powell, and Yetton (2001) that SMEs have not fully grasped use of ICT.

Most businesses entrepreneurs feel like they a weak financial capacity to invest in ICT structures and tools for better management of their business. They felt that their financial capacity is limited to the basic requirements of a business. As shown in Table 2, 56% of the respondents strongly disagreed with the statement “I have set aside a special ICT fund for my business”. Consequently, 58% of the respondents either agreed or strongly agreed to the statement “my hand to mouth financial existence” cannot allow me to use ICT tools. This means that most businesses in Kenya do not consider investment in ICT as a priority. This is partly because their financing options are limited hence they would rather utilize the available funds to stock or expand their business first. The chi-square value of 7.890 has a significance level of 0.049 which is less than the acceptable alpha of 0.05. This establishes a statistically significant relationship between financial capacity and access and use of ICT. This means that financial capacity affects ICT adoption by small enterprises.

Table 2: Effect of financial capacity on ICT Adoption

| Item | Response | | | | | | | |
|--|----------|------|----|------|----|------|----|------|
| | SD | | D | | A | | SA | |
| | F | % | F | % | F | % | F | % |
| 1. I have enough money in my business to invest in ICT | 19 | 36.5 | 14 | 26.9 | 14 | 26.9 | 05 | 09.6 |
| 2. Hand to mouth financial existence cannot allow me to use ICT | 11 | 21.2 | 11 | 21.2 | 17 | 32.7 | 13 | 25.0 |
| 3. I have set aside a special ICT fund for my business | 29 | 55.8 | 03 | 05.8 | 15 | 28.8 | 05 | 09.6 |
| 4. Financial capacity of an enterprise has an effect on ICT Adoption | 02 | 03.8 | 03 | 05.8 | 13 | 25.0 | 34 | 65.4 |

Source: Survey Data, 2010

Most business owners believe that the cost of ICT tools and equipment is high thus discouraging investment leading to poor adoption levels. According to the study findings (Figure 1), majority of the respondents (58%) strongly agree that cost has an effect on ICT adoption in small enterprises in Kenya. None of the respondents disagreed with the statement. The feeling is that taxation on ICT is high and that prices of some ICT tools and equipment has been inflated making them unaffordable.

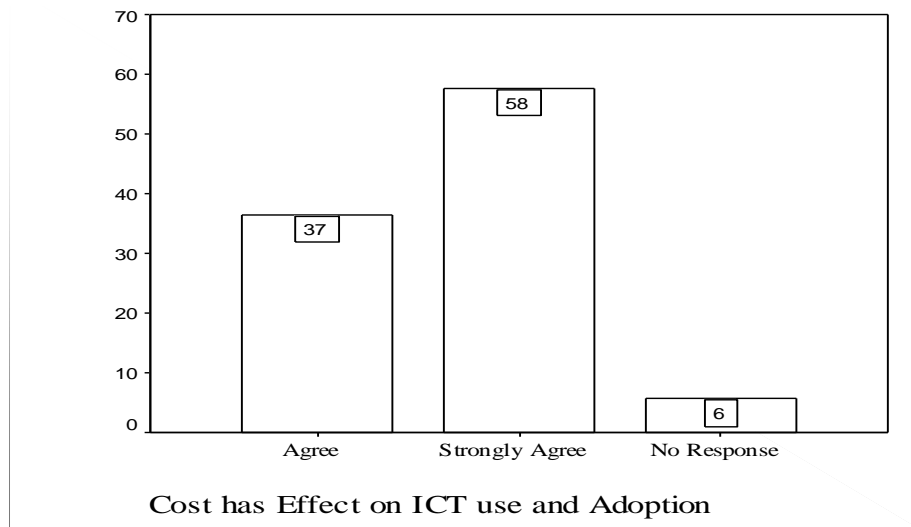


Figure 1: Effect of cost on ICT use and adoption

Although communication infrastructure is a pre-requisite to the use of ICT, most small enterprise operators felt that the infrastructure is not well developed to boost ICT adoption. As shown in Figure 2, most of the respondents are of the view that communication infrastructure affects the adoption of ICT by small scale enterprises. Considering that infrastructure is one of the pre-requisites of ICT adoption, its poor state or lack of it would definitely have a negative effect. 46% of respondents agree that internet modems on offer are too expensive. Approximately 30% believe that internet connection requires fixed telephone lines that are expensive to install. On the other hand 60% of respondents feel that the infrastructure is not adequate.

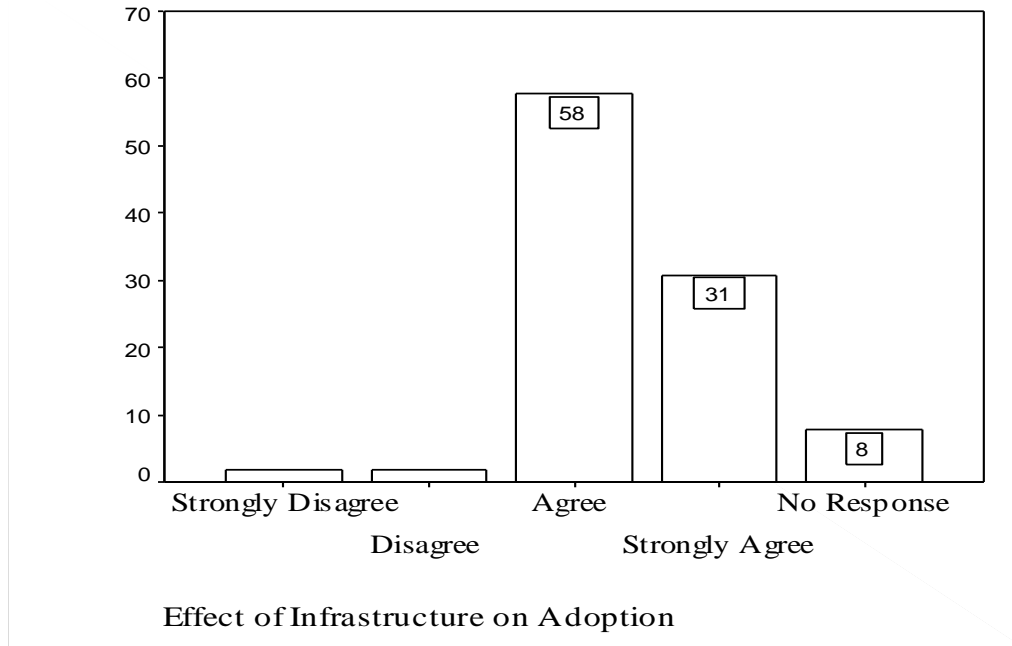


Figure 2: Influence of Infrastructure on access and use of ICT

Cross tabulation was performed with chi-square statistics to establish the relationship between communication infrastructure and ICT adoption. The analysis revealed a value of 21.65 with 0.001 significance level; far less than the acceptable alpha of 0.05, implying that there is a statistically significant relationship between communication infrastructure and ICT adoption by small enterprises. The level of knowledge on ICT systems as well as education level of the business proprietor was found to have a significant relationship with ICT adoption. More knowledgeable and learned proprietors are more likely to adopt ICT than less knowledgeable and learned proprietors.

Majority of the respondents agreed with the assertion that knowledge level affects ICT adoption as shown in Table 3. Only 4% of the respondent disagreed. Further, 46% of respondents do not see the importance of ICT in their business, whereas 50% of the respondents do not have prior knowledge on ICT opportunities. Interestingly, majority of the respondents agreed with the assertion that they do not understand the importance of ICT and therefore, do not see ICT as necessary in their business.

Table 3: How knowledge level affects adoption

| Statement | Response | | | | | | | |
|---|----------|------|----|------|----|------|----|------|
| | SD | | D | | A | | SA | |
| | F | % | F | % | F | % | F | % |
| 1. Do not see the importance of using ICT in my business | 15 | 28.8 | 11 | 21.2 | 12 | 23.1 | 12 | 23.1 |
| 2. I have no prior knowledge on ICT Opportunities | 15 | 28.8 | 08 | 15.4 | 15 | 28.8 | 12 | 23.1 |
| 3. I do not understand the importance of ICT use in my Business | 21 | 40.4 | 09 | 17.3 | 09 | 17.3 | 11 | 21.2 |

Chi-square tests revealed a statistically significant relationship between education/knowledge level of the entrepreneurs and ICT adoption. The analysis revealed a value of 16.063 with a significance level of 0.013 (Table 4); far less than the acceptable alpha of 0.05.

Table 4: Relationship between level of education and level of ICT adoption

| Level of education | Access and use of technology | | | | | | Total |
|--------------------|------------------------------|------|---------|------|-----|------|----------|
| | High | | Average | | Low | | |
| Primary | 0 | 0.0 | 1 | 1.9 | 4 | 7.7 | 5 9.6 |
| Secondary | 4 | 7.7 | 7 | 13.5 | 5 | 9.6 | 16 30.8 |
| College | 9 | 17.3 | 5 | 9.6 | 6 | 11.5 | 20 38.5 |
| University | 9 | 17.3 | 1 | 1.9 | 1 | 1.9 | 11 21.2 |
| Total | 22 | 42.3 | 14 | 26.9 | 16 | 30.8 | 52 100.0 |

Chi-square test: Value = 16.063, df = 6, Significance = 0.013

Entrepreneurs with primary level of education reported low ICT adoption while those who had at least college level of education reported high adoption. This implies that level of education and knowledge significantly affects the access and use of ICT among small enterprises in Kenya. The low education and knowledge level among small scale entrepreneurs tends to affect the confidence with which they approach investment decisions concerning ICT.

Conclusions

Information and communication technology has not been well embraced by small enterprises in Kenya as manifested by low adoption levels. The entrepreneurs have a weak financial capacity to invest in ICT tools and equipment for better management of their business as their financial capacity is limited to the basic business requirements. There is a statistically significant relationship between financial capacity and ICT adoption, implying that financial capacity of the business determines adoption level. Most small scale entrepreneurs believe that the cost of ICT tools and equipment is high, discouraging investment in them. The study concludes that cost has had a negative impact on ICT adoption by small enterprises in Kenya. There is a strong statistical relationship between communication infrastructure and adoption as supported by a chi-square value of 21.65 with 0.001 significance level, which is far less than the acceptable alpha of 0.05. Some technologies would require landline or LAN systems which require huge financial investments; only available in large enterprises.

The level of understanding on various ICT tools and equipment hinders adoption. Although most small scale entrepreneurs are aware of their existence, they do not think that such technologies are necessary for their enterprises. Small enterprises which have not embraced ICT attribute the status to their inability to finance installation of the required infrastructure. They operate on a lean capital base that would not allow investments in ICT; they operate on hand-to-mouth financial regime. Entrepreneurs with primary level of education reported low adoption while those who had at least college level of education reported high adoption. Therefore, the level of education and knowledge significantly affects ICT adoption in small enterprises in Kenya.

Recommendations

The Government should make ICT more affordable to SEs by lowering the tax and regulating their prices so as to curtail dealers inflating prices. The Government through the ministries of Trade, Information and Communication should initiate and support training programmes to develop the capacity of small and medium entrepreneurs in ICT tools. The Government should source for and invest in communication infrastructure targeting small enterprises. The Government should make deliberate programmes to create awareness on the utility of ICT use in small enterprises as supported by Chadwik & Rumfitt (2002). In line with the results of a study by Harindranath et al (2008), it is recommended that small enterprises should spare part of the earned profits to invest in basic ICT tools and equipment to help improve their business management practices in line with global trends; to make them more competitive and access global markets. The Kenya Federation of Small Enterprises should establish a special fund to finance ICT adoption by small enterprises.

References

- Brown, D., Lockett, N. and Schubert, P. (2005). Preface to the focus theme section 'SMEs and e-Business', in *Electronic Markets*, 15, 2, 76-78.
- Caldeira, M.M. and Ward, J. M. (2002). "Understanding the successful adoption and use of IS/IT in SMEs: an explanation from Portuguese manufacturing industries" in *Information Systems Journal*, 12, 2, 121-152.
- Chadwick, M. and Rumfitt, A. (2002). Intervention versus market forces in the E-enablement of London's SMEs: the role of business link for London. Shared Intelligence and Business Link for London.
- Frempong, GK (2004), Restructuring of the Telecoms Sector in Ghana: Experiences and Policy Implications, Unpublished PhD Thesis, University of Ghana, Accra.
- Harindranath, G. Dyerson, R. and Barnes, D. (2008). "ICT Adoption and Use in UK SMEs: a Failure of Initiatives? In *The Electronic Journal Information Systems Evaluation*, 11, 2, 91-96.
- Keen, P. and MacDonaold, M. (2000). *The eProcess Edge*, Berkley, Osborne/McGraw Hill, California.
- Kotelnikov, V. (2007). *Small and Medium Enterprises and ICT*. A publication of the United Nations Development Programme.
- Levy, M., Powell, P. and Worrall, L. (2005) "Strategic intent and e-business in SMEs: Enablers and inhibitors", in *Information Resources Management Journal*, 18, 4, 1-20.
- Levy, M., Powell, P. and Yetton, P. (2001), "SMEs: Aligning IS and the strategic context", in *Journal of Information Technology*, 16, 3, 133-144.
- METI (2001). *White Paper on Small and Medium Enterprises in Japan*, SME Agency of Japan (available at <http://www.chusho.meti.go.jp/hakusyo/h13/download/2001eibunzennbun.pdf>)
- Moodley, S. (2002), "E-Business in the South African Apparel Sector: a Utopian Vision of Efficiency?" in *The Developing Economics*, 40, 1, 67-100.
- OECD (2002a). "The Impacts of Electronic Commerce on Business: Summary", STI/ICCP/IE(2002)5/FINAL, OECD, Paris.
- OECD (2004). *ICT, E-BUSINESS AND SMEs*, OECD, Paris.
- Pool, P.W., Parnell, J.A., Spillan, J.E., Carraher, S. and Lester, D.L. (2006). "Are SMEs meeting the challenge of integrating e-commerce into their businesses? A review of the development, challenges and opportunities", in *International Journal of Information Technology and Management*, 5, 2/3, 96-113.
- Rae, A. (2006). *Abandoned Heroes – ICT Adoption and Use in SMEs*. West Focus ICT Project
- Republic of Kenya, 1992. The Sessional Paper No. 2 of 1992 on Small Enterprise and Jua Kali Development in Kenya, Nairobi: Govt. Printer.
- Sakai, K. (2002), "Global Industrial Restructuring: Implications for Small Firms", STI Working Papers 2002/4, OECD, Paris (available at <http://www.oecd.org/sti/working-papers>)
- Tetteh, E. and Burn, J. (2001). Global Strategies for SME-Business: Applying the small framework. *Logistics Information Management*, 14, 1/2, 171-180
- Wymer, S. A. and Regan, E. A. (2005) "Factors influencing e-commerce adoption and use by small and medium businesses" *Electronic Markets*, 15, 4, 438-453.