

ICT POSSESSION AND USAGE AMONG CONGOLESE SMALL AND MEDIUM-SIZED ENTERPRISES: AN EXPLORATORY STUDY

Jean D. Kabongo

College of Business, University of South Florida, Sarasota-Manatee
8350 N. Tamiami Trail, SMC-C263, Sarasota, FL 34243-2025, USA

jkabongo@sar.usf.edu

Phone: +1 (941) 359-4234

ABSTRACT

This study investigates the possession and usage of information and communication technologies among small and medium-sized enterprises in the developing economy of the Democratic Republic of the Congo. The results of the study demonstrate that nearly 98% of SMEs in the sample possessed and used one or more mobile phones.

Keywords: ICT possession and usage, small and medium-sized enterprises, emerging economy, DR Congo.

INTRODUCTION

Over the past two decades, the use of information and communication technologies (ICTs) by small and medium-sized enterprises (SMEs) has generated a great deal of interest among researchers, governments, and international organizations (Mehrtens et al, 2001; Drew, 2003; Grandon & Pearson, 2004; UNDP, 2004; Levy & Powell, 2005; Kuckertz, 2006; Simmons et al, 2007). This growing attention is stimulated by at least two main components: the role of SMEs in economic development and the perceived benefits of ICT usage relative to the competitive growth of SMEs (Hallberg, 2000; Porter, 2001). First, SMEs play a decisive role in the economies of most nations (Beck et al., 2003). From the perspective of new business creation, Kuratko (2005) indicates that due to the spirit of innovation and the pursuit of economic success, small businesses make undeniable contributions to market economies. In fact, in good economic times, small businesses create 60 to 80 percent of net new jobs annually in the United States (Ou, 2006). Second, research suggests that SMEs can benefit from ICTs by transforming the way they operate and making them more competitive in their respective industries (Davis & Harveston, 2000; Poon, 2000; Urwin, 2000; Stockdale & Standing, 2004; Levy & Powell, 2005; Chong & Pervan, 2007).

To date, compared to other sub-Saharan African countries, such as Botswana (Mbambo & Cronjié, 2002; Iyanda & Ojo, 2008), Namibia (Chiwere & Dick, 2007), Uganda, Tanzania (Chowdhury & Wolf, 2003), South Africa (Cloete et al, 2002; Molla & Licker, 2004), ICT usage by SMEs in the Democratic Republic of the Congo (DRC) has received little attention in the literature. The main objective of this paper is to investigate further the possession and usage of ICTs by SMEs based on a survey of Congolese SMEs located in three major cities of the country. The paper also investigates which industrial sectors are more likely to report higher ICT usage intensity. More specifically, the paper describes the nature and extent of the possession and usage of fixed telephone line, mobile phone, fax, post box, computer, Internet connection,

and Web site. In doing so, the paper first provides background information on ICT indicators and the state of the economy of DRC. Next, it presents an overview of studies on ICT usage by SMEs—in developed, emerging, and developing African economies—and builds the research questions. Then, the paper will explain the methodology used to conduct the study. Lastly, the results of the study will be presented and discussed.

BACKGROUND

DRC is a country of about 72 million people located in central Africa. The economy of DRC is slowly recovering after two decades of decline due to internal conflicts. Table 1 presents the characteristics of DRC. Agricultural sectors count for 37% of the country's \$23.12 billion GDP (2010 estimate). The agriculture, farming, and fishing industries have been identified as priorities by the Federation of Congolese Enterprises (FCE) for the following two reasons. First, to cover the food needs of the population whose deficit in several products (maize, cassava, rice, sugar, beans, fish, meat, etc.) is increasingly imported. Second, to allow the supply of industrial raw materials, given the comparative advantage of each province, and provide support for the momentum of the revival and development of several programs to increase the value added to the nation's economy.

According to the 2007 report *Measuring Information Society* by the International Communication Union (ITU, 2007), all indicators measuring ICT are very low in the case of DRC with the exception of the adult literacy rate, which is at 67.2%. Table 2 depicts the ICT-OI for the DRC.

Insert Table 1 about here

Insert Table 2 about here

ICTs USAGE BY SMEs: AN OVERVIEW OF STUDIES

Defining ICTs

Information and communication technologies (ICTs) have been defined in different ways. For instance, Tinio (2002) conceptualized ICT as “a set of technological tools and resources used to communicate, to create, disseminate, store, and manage information”. Not only these tools include computers and Internet, but also broadcasting technology such as radio, television, and telephony (p. 3). In the perspective of entrepreneurship and small businesses, ICTs have been defined in several ways depending on the context and research interest of the author. For instance, studies conducted in the United States often use the term “information technology” (IT) instead of ICT (see Aral & Weil, 2007; Croteau & Raymond, 2004; Dibrell, Davis et al, 2006; Lee & Runge, 2001; Ray et al, 2005). Boar (1997, p. 28) conceptualized information technology in terms of “technologies engaged in the operation, collection, transport, retrieving, storage, access presentation, and transformation of information in all its forms.” In this perspective, IT

focuses on enhancement of capability and the ability to innovate and operate efficiently and effectively through Internet-based linkages with key business constituencies. However, in many developing economies, the diffusion of Internet-based applications remains limited due to the lack of resource endowments. The central point of analysis becomes the extent to which SMEs utilize any information and communication tools available and affordable to them in order to manage daily operations and make a profit. For this study, ICT is understood as a set of tools and activities that facilitate the coding, processing, decoding, and display of information – fixed telephone line, postal box, fax machine, mobile phone, personal computer, electronic mail – and the strategy to operate efficiently and effectively.

ICT usage by SMEs in emerging markets

To date, most of the research has focused on key issues that determine ICT adoption and usage by SMEs in many countries affiliated with the Organization for Economic Co-Operation and Development (OECD) (Raymond, 2001; Lawson et al, 2003; Jun & Cai, 2003; Grandon & Pearson, 2004; Simmons et al, 2007). Likewise, many studies have analyzed ICT adoption and usage behavior by SMEs in emerging market economies, including China (Tan et al, 2007), Costa Rica (Travica, 2002), Malaysia (Mukti, 2000), Sri Lanka (Kapurubandara & Lawson, 2008), and Turkey (Kula & Tatoglu, 2003). There is an expectation that new information technologies will enable SMEs in developing countries to establish contact with and participate in the world economy (Rayport & Jawaorski, 2003).

In reviewing studies on ICT adoption and usage by SMEs in developing market economies, with a primary focus on e-commerce, Kapurubandara & Lawson (2008, pp. 109–111) attempted to group these studies into the three categories of internal barriers, external barriers, and adoption models, factors that affect the adoption of e-commerce—and thus ICTs—in developing countries. Internal barriers include owner/manager characteristics, firm characteristics, and costs and return on investment. The owners' lack of awareness of technology and its perceived benefits (Iacovou et al, 1995); low computer literacy (Kirby & Turner, 1993); lack of assertiveness (Julien & Raymond, 1994); lower computer usage (Iacovou et al, 1995); lack of access to computer software and hardware (Cloete et al, 2002), and organizational culture (Schmid et al, 2001) are among the internal factors. The external barriers include political, infrastructure, sociocultural, and legal/regulatory factors. For instance, legal and liability issues (Schmid et al, 2001); minimum use of computers by customers and suppliers (Cloete et al, 2002); and low income, lack of fixed telephone lines, and the undeveloped state of ISPs (Panagariya, 2000) are among the external factors. The adoption models include the organizational, industrial, and national support factors that are geared toward facilitating the removal of barriers and spurring adoption.

In analyzing ICT usage, innovation, and company performance across various European sectors, E-Business Watch (2008, p. 5) found that ICT adoption, use, and diffusion depended on certain market and firm characteristics, such as competition levels and value chain characteristics. From this perspective, SMEs view ICT adoption as a strategic tool that will enable them to improve the level of competitiveness in their industry. This shapes competition within an industry by addressing: the risk of entry by potential competitors, the intensity of rivalry among established

companies within an industry, the bargaining power of suppliers, the bargaining power of buyers, and the closeness of substitutes to an industry's products (Porter, 1980). As evidenced by Earl (1989), Galliers & Sutherland (1999), and Hollander et al (2000), these become the drivers of ICT usage. The results of the study reported by E-Business Watch (2008, p. 5) provided evidence of increasing competition among firms. As a result, rivalry in the market induced companies to use more ICT components in the areas of transport and logistics services and retail sectors. This study illustrates that in these sectors, companies seem to use ICT in order to reduce costs and look for innovative ways of conducting business.

ICT usage by SMEs in Africa

Many studies have analyzed ICT usage by SMEs in some African economies (see Stock & Essalaar, 2006; Chowdhury & Wolf, 2003; Wolf, 2001), with Essalaar et al (2007) perhaps the most recent and comprehensive. This study analyzed ICT usage and its impact on profitability of selected SMEs in each of 13 countries including Botswana, Cameroon, Ethiopia, Ghana, Kenya, Mozambique, Namibia, Nigeria, Rwanda, South Africa, Tanzania, Uganda, and Zimbabwe. ICT tools assessed included working fixed-line telephones, fax machines, mobile phones, post boxes, computers, and Internet connections. While differences in ICT usage exist among African countries, Essalaar et al (2007) provided main tendencies and valuable insights regarding the use of ICT by SMEs in the countries considered in the study.

The study found that mobile phones were the preferred tool, with nearly 95% of formal SMEs possessing and using them for business operations. In terms of fixed telephone lines, 60% of SMEs reported not having one, but considered it important or very important for their businesses. Nearly half of SMEs did not own a computer and 45% did not have a computer with Internet connection. However, 20% of SMES that did not have an Internet connection often utilized cyber cafes. Finally, Essalaar et al (2007) found that 35% of SMEs continued to use a postal box for business operations and 20% of them used it to order supplies.

RESEARCH QUESTIONS

Four research questions were constructed to shape the purpose of this study. The first examines the relationship of SMEs to ICT tool possession, including fixed telephone line, mobile phone, fax, post box, personal computer, Internet connection, email, , and Web sites across all industrial sectors as of 2008. ITU (2007) positioned DRC as the least performing country in terms of info-density (17.0), info-use (8.97), and ICT-OI value (12.33). Panagariya (2000) observed that low computer and Internet penetration, poor Internet connectivity, and lack of a national telecommunication infrastructure are among the factors that hinder the adoption and use of ICTs by SMEs in developing economies. The second question analyzes the actual usage of the above mentioned tools to communicate with customers and client and to order supplies. The third question looks further at the relationship of industrial sectors to higher rates of ICT usage. Shields, McIvor, and O'Reilly (2003) highlighted that the characteristics of the firm and industry sectors contribute to the extent of adoption and exploitation of ICTs by SMEs relative to the support of business processes. In other words, the level of competition in an industry is likely to be correlated with the usage of ICT tools. From the perspective of this exploratory study, the

focus is rather on highlighting the industrial sectors that have higher levels of ICT intensity and proposing a working explanation given the structure of the developing economy of the country.

In addition to the relationship of industrial sectors to higher rates of ICT usage, the fourth question examines ICT intensity closely, specifically in the agricultural industrial sector, based on the anticipated growth in this sector. In fact, the Federation of Congolese Enterprises (FCE) prioritizes agriculture, farming, and fishing industries. Moreover, since agriculture is the mainstay of the economy, it amounted to 55% of its GDP in 2008. The main cash crops include coffee, palm oil, rubber, cotton, sugar, tea, and cocoa. The primary food crops are cassava, plantains, maize, groundnuts, and rice (CIA World Factbook, 2009). Since firms that operate in agricultural sectors will more likely be engaged in import-export operations and develop long-term relationships with customers and suppliers, we therefore infer that ICT usage in the agribusiness sector will be higher than in other sectors.

Therefore, we posit the following research questions:

Research Question 1: How do SMEs rate on the possession of fixed telephone line, fax, mobile telephones, email, computer, and Web sites?

Research Question 2: How do SMEs rate on the usage of fixed telephone line, fax, mobile telephones, email, computer, and Web sites?

Research Question 3: What are the industrial sectors with high levels of ICT intensity?

Research Question 4: Does the highest ICT intensity rate relate to the agribusiness sector?

METHODOLOGY

To investigate ICT possession and usage by SMEs in DRC, a survey of SMEs located in three major cities of the country was conducted. Businesses were selected from the online edition of the 2008 business directory. Choosing to examine ICT possession and usage through a survey of SMEs based on the online business directory produced a colossal task for this research in view of the circumstances and overall state of information technology available in DRC. The primary challenge was that the study relied exclusively on information available from the directory Web site, which was secondary data. While the online edition provided some quantitative and qualitative data that offer insight into the use of fixed telephone line, mobile phone, email, fax, and Web sites, this online information could not produce the kind of data needed to produce a complete picture of the state of ICT possession and usage by SMEs in DRC.

Another challenge was that the study did not consider businesses operating in the informal sector of the economy as some studies have attempted to do (see for instance Esselaar et al, 2007). Perhaps the most important fact is that despite all of these challenges and limitations, the data collected provided a substantial opportunity to track and document the number and nature of ICT tools being used by formal SMEs in DRC.

Data collection and analysis

The list of SMEs considered in the study was obtained from the Federation of Congolese Enterprises Web site and an in-depth search of various contributing Web sites. Data on the possession and usage of ICT tools were obtained through telephone interviews. A semi-structured interview lasting between ten and twenty minutes was conducted with the owner/representative of each business. Participants were asked to discuss ICT possession and usage in as much detail as possible. Each recorded interview was audio-taped and subsequently transcribed in its entirety so that the raw data could be analyzed systematically. Originally, 490 firms located in three major cities of the country, including the national capital, were addressed by the study. The businesses were classified according to the International Standard Industrial Classification in the following sectors: (A) agribusiness, forestry, and fishing; (C) manufacturing; (GH) wholesale and retail trade, transport and storage; (I) accommodation and food service activities; (JK) information and communication, financial and insurance services; (LMN) real estate activities, professional; scientific and technical services, administrative and support service activities.

From the description of the firms provided in the directory and the legal form-joint stock company, limited company and sole proprietorship, we searched for SMEs, ultimately identifying 490 of them. The Federation of Congolese Enterprises Web site uses the new definition of SMEs proposed by the European Commission (EC, 2005), which took effect on January 1, 2005. According to the EU, small and medium enterprises are firms that employ up to 250 people and produce up to \$50 million in sales. Of the 490 SMEs identified originally, 333 (67.9%) had to be removed from the study because they did not pertain to any industrial sectors, they were classified under the category of “other,” and data for the ICT use/report were not available for the majority. Data for the study were obtained from the remaining 157 SMEs (32%) that were identified in the industrial sectors according to the International Standard Industrial Classification (table 3).

Insert Table 3 about here

We adapted Esselaar et al (2007) to determine three ICT indexes: possession, usage, and intensity. For the first question, the possession index related to the rate of fixed telephone line, mobile phone, fax, post box, personal computer, Internet connection, email, and Web site possession. A measure of 1 was assigned if an ICT tool was possessed while 0 was assigned if this was not the case. The maximum value for possession index was 8 (table 4). The means and standard deviations were used to determine the extent to which SMEs rate on ICT possession. For the second question, the usage index related to use of each ICT tool possessed in two fronts: communicate with key constituencies and order supplies. A measure of 1 was assigned if an ICT tool was used to conduct business while 0 was assigned if this was not the case. The maximum value for usage index was 15 (table 5). The means and standard deviations were used to determine the extent to which SMEs rate on ICT usage. For the third question on industrial sectors with high levels of ICT usage, the intensity index was calculated by taking the usage index and dividing it by the possession index. The intensity index expressed the extent to which

a firm actually used all the eight ICT tools mentioned to conduct the fifteen business activities. Finally, for the fourth question on ICT intensity related to the agricultural sector, a simple comparison was used to determine whether the agricultural sector ranked the highest of the industrial sectors studied.

Insert Table 4 about here

Insert Table 5 about here

FINDINGS AND DISCUSSION

Table 6 shows the extent of ICT possession among the sample of 157 SMEs, based on the mean measure and standard deviation. For the set of eight ICTs considered in the study, the two technologies with the largest frequency of possession are mobile phone and e-mail. Nine in ten SMEs (0.987) possessed one or more working mobile phones while three-fourths (0.732) reported an e-mail address; 70% possessed a working computer and a post box; 45% had an Internet connection and 43% reported a fixed telephone line. Only one SME in five (0.267) possessed a Web site. This low Internet penetration supports Panagariya (2000) relative to the lack of national telecommunication infrastructure as one factor that hinders the adoption and use of ICTs by SMEs in developing economies. Less than 20% (0.171) of SMEs reported a fax number. Overall, SMEs in the study possessed at least half of the eight tools assessed (4.471).

Insert Table 6 about here

The findings of the possession of the ICT tools considered in the study are consistent with those of Esselaar et al (2007). The results of the present study are also in line with reports indicating that developing countries are embracing mobile phones (ITU, 2007). In fact, according to this report, 6 in 10 people around the world now have mobile phone subscriptions, thus demonstrating that mobile phones are the default communications technology, particularly in developing countries.

Insert Table 7 about here

Not surprisingly, the results in table 7 show that mobile phones (0.993) were more used for business activities than any other ICT tool assessed in the study. While SMEs in the sample possessed (0.713) and used the post box to communicate with key constituencies (0.726), they used it less to order supplies (0.095). This can be explained by the fact that the post office still handles formal communications coming from different government agencies and professional

associations. Esselaar et al (2007) found that 35% of SMEs used the post box to communicate with customers while 20% used it to order supplies. A large number of SMEs used the Internet (e-mails) to communicate with key constituencies and to order supplies (0.681). However, the Internet was less used for business applications (0.318) due to the fact that only 27% of SMEs in the study had a business Web site and 45% had an Internet connection.

The fact mobile phones and emails were largely used to communicate with key constituencies and to order supplies indicates that formal SMEs in DRC are above the national average in terms of ICT-OI rates. In fact, according to the ITU, nearly 5% of the country's population uses mobile phones. SMEs seem to do much better, with 99% of them reporting and using at least one working mobile phone. The same ITU reports that less than 1% of the population uses the Internet. The results show that 68% of SMEs in the sample used Internet (emails) to communicate with key constituencies and to order supplies. Overall, the usage index for the sample was 6.592, which indicates that SMEs surveyed used ICT tools in 44% of the activities listed for business purposes.

Insert Table 8 about here

The results in Table 8 indicate that SMEs operating in the whole and retail trade, transportation and storage sectors reported the highest level of ICT intensity (1.611). After the whole and retail trade, transportation and storage sectors, the most representative sectors were accommodation and food service activities (1.560); information and communication, financial and insurance services (1.481); manufacturing (1.480); real estate activities; professional, scientific and technical services; administrative and support service activities (1.476). The rate of ICT intensity in the agribusiness, forestry, and fishing sector (1.197) is not related to the highest among SMEs studied.

CONCLUSION

This study fills a gap in the research into ICT usage by SMEs in developing countries by analyzing a sample of SMEs in DRC to determine the rate of the possession and usage intensity of fixed telephone line, mobile phone, fax, post box, computer, Internet connection, email, and Web sites to perform business activities; the industrial sectors with the highest levels of ICT usage intensity; and the rate of ICT usage intensity in the particular sector of agriculture, forestry, and fishery. The results of the study demonstrate that nearly 98% of SMEs in the sample reported and used mobile phone for business operations, making this tool the most popular among SMEs studied. Seventy-one percent of SMEs had a post box but did not use it much to order supplies. Sixty-eight percent of SMEs studies used emails to communicate with customers and to order supplies. Only 27% of them reported having a firm Web site. Far less than 20% (0.171) reported a fax number, while 72% of the SMEs in the sample used a working computer. The whole and retail trade, transportation and storage sectors demonstrated the highest rate of ICT usage intensity (1.611).

This highest rate of ICT usage intensity among SMEs in the whole and retail trade, transportation and storage sectors can be explained by the fact that small firms operating in these sectors are importers of finished goods mostly from Western Europe, the United States, China, and Dubai. These small firms tend to build their competitive advantage around the internal and external barriers to ICT usage by SMEs in developing countries (Davis & Harveston, 2000; Poon, 2000; Urwin, 2000; Stockdale & Standing, 2004; Levy & Powell, 2005; Chong & Pervan, 2007). In other words, these SMEs can leverage these barriers and therefore capitalize on the possession and use of ICTs in their operations. The nature of activities in the whole sale and retail sector requires entrepreneurs to be computer literate (Cloete et al, 2002), gather resources and skills (Schmid et al, 2001), have access to a computer, software, and hardware (Cloete et al, 2002), and understand the legal and liability issues associated with the use of computers (Schmid et al, 2001). The second highest rate of ICT usage intensity among SMEs in the accommodation and food service activities sector can be explained using the same arguments. In fact, the firms operating in this sector are increasing the electronic business transactions to accommodate international travelers who use credit cards and make online reservations. The agribusiness sector was ranked sixth in ICT usage intensity behind whole sale and retail, transportation and storage; accommodation and food service activities; information and communication, financial and insurance services; manufacturing; and Real estate, professional and administrative services. Overall, ICT possession and usage by formal SMEs in DRC seems to be at a stage in its development that is characterized by increased rates in the use of mobile phones and email among small entrepreneurs. In particular, the findings of the study indicate four trends.

First, SMEs with a business model based on the clear intent to create and capture value through the reduction of transaction costs and disintermediation, thus performing activities using electronic links to its key constituencies—as is the case in the whole and retail trade; transportation and storage; and accommodation and food service activities—seem to be experiencing higher rates of ICT possession and usage. These findings give consistency to what the body of research has concluded relative to the adoption and use of ICT by SMEs and its relation to certain market and firm characteristics, such as levels of competition and value chain characteristics. In fact, Earl (1989), Galliers & Sutherland (1999), and Hollander et al (2000) identified the forces that shape competition within an industry and become the drivers of ICT adoption include the risk of entry by potential competitors, the intensity of rivalry among established companies within an industry, the bargaining power of suppliers, the bargaining power of buyers, and the closeness of substitutes to an industry's products.

Next, there is some indication that agribusiness firms are lagging behind in the ICT usage intensity. This usage intensity is more likely to make them competitive both in the domestic and international markets. In fact, agribusiness firms are expected to contribute significantly to the growth of the Congolese economy and therefore are based on the priorities established by the Federation of Congolese Enterprises (FCE). The possession and usage of the post box by a large number of SMEs in the study is an interesting trend. The modernization of the Congolese postal service across the country and the development of business solutions would address the needs of many SMEs in terms of reliable, affordable national and international mailing and shipping services. This could revitalize many industrial sectors and get SMEs rolling. Lastly, ICT possession and usage by SMEs in the sample tends to be higher than the national.

The fact that the study depended exclusively on the data obtained from 157 SMEs associated with the FCE in DRC represents both a distinct limitation and a unique perspective. Clearly, the findings of this study cannot be generalized to all SMEs in the country. Thus, future research is needed to conduct studies into incorporating ICT in SMEs that are not reported in the national business directory.

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TABLE 1
Characteristics of DR Congo

Area	2,345,410 sq km
Population	71,712,867 (January 2011 est.)
Languages:	French (official), Lingala (a lingua franca trade language), Swahili, Kikongo, Tshiluba.
GDP (purchasing power parity)	\$ 23.12 billion (2010 est.)
GDP real growth rate	7.2% (2010 est.)
GDP/capita	\$ 300 (2010 est.)
GDP composition by sector	Agriculture : 37.4% Industry: 26% Services: 36.6% (2008 est.)
Exports; biggest partners	\$ 3.8 billion (2009) diamonds, copper, crude oil, coffee, cobalt China 46.75%, USA 15.35%, Belgium 10.68%, Zambia 5.78% Finland 4.38% (2009).
Imports; biggest partners	\$ 5.3 billion (2009) foodstuffs, mining and other machinery, transport equipment, fuels South Africa 18.22%, Belgium 10.2%, China 8.34%, Zambia 7.78%, France 7.77%, Zimbabwe 6.52%, Netherlands 3.96% (2009).
Inflation rate (consumer prices)	26.2% (2010 est.)
Unemployment rate	8.9 (2009 est.)
Underemployment rate	81.7 (2009 est.)
External debt	\$ 13.5 billion (2010 est.)
Telephones	40,000 fixed lines, 168 th in the world (2009 est.) 10.163 million Mobile phones, 63 rd in the world (2009 est.)
Internet hosts	3,006, 146 th in the world (2009 est.)
Internet users	290,000, 131 st in the world (2009 est.)

Sources: CIA Factbook (2011), The World Bank Report (2011).

TABLE 2
DR Congo ICT-Opportunity Index (2007)

	Indicator	Index	
<i>Info Density</i>	Networks	Main telephone lines per 100 inhabitants:	0.02
		Mobile cellular subscribers per 100 inhabitants:	4.77
		International Internet bandwidth (kpbs per inhabitants):	0.10
	Skills	Adult literacy rate:	67.2
		Combined gross enrollment ratio (primary, secondary, and tertiary):	33.7
<i>Info use</i>	Uptake	Internet users per 100 inhabitants:	0.24
		Televisions per 1000 inhabitants:	3.0
		Computers per 100 inhabitants:	N/A
	Intensity	Total broadband Internet subscribers per 1000 inhabitants:	0.03
		International outgoing telephone traffic (minutes) per capita:	N/A

Source: International Telecommunication Union.

TABLE 3
ICT possession index

The firm possesses	Index value
At least one working fixed telephone line	1
At least one working mobile phone	1
At least one working fax machine	1
At least one working post box	1
At least one working computer	1
An Internet connection	1
An email	1
A Web site	1
Maximum value	8

TABLE 4
ICT usage index

The firm	Index value
Used the telephone to communicate with key constituencies	1
Used the telephone to order supplies	1
Used the mobile phone to communicate with key constituencies	1
Used the mobile phone to order supplies	1
Used the fax to communicate with key constituencies	1
Used the fax to order supplies	1
Used the post box to communicate with key constituencies	1
Used the post box to order supplies	1
Used the computer to communicate with key constituencies	1
Used the computer to order supplies	1
Used the Internet to communicate with key constituencies	1
Used the Internet to order supplies	1
Sent SMS or text messages for business purposes	1
Received SMS or text messages for business purposes	1
Used the Internet for business purposes	1
Maximum value	15

TABLE 5
Sample distribution: International Standard Industrial Classification

Industrial Sector	Frequency	Percent	Cumulative
Agriculture, forestry, and fishing	9	5.73	5.73
Manufacturing	13	8.28	14.01
Whole and retail trade, transportation and storage	87	55.41	69.43
Accommodation and food service activities	9	5.73	75.16
Information and communication, financial and insurance	7	4.46	79.62
Real estate, professional and administrative services	32	20.38	100.00
Total	157	100.00	

TABLE 6
ICT possession by SMEs in the study (N =157)

ICT tool	Mean	Std. deviation
Fixed telephone line	0.433	0.497
Mobile phone	0.987	0.112
Fax machine	0.171	0.378
Post box	0.713	0.453
Personal computer	0.715	0.456
Internet connection	0.452	0.499
Email	0.732	0.444
Web-site	0.267	0.444
Possession index	4.471	2.360

TABLE 7
ICT usage by SMEs in the study (N = 157)

The firm	Mean	Std. deviation
Used the telephone to communicate with key constituencies	0.458	0.499
Used the telephone to order supplies	0.458	0.499
Used the mobile phone to communicate with key constituencies	0.993	0.079
Used the mobile phone to order supplies	0.993	0.079
Used the fax to communicate with key constituencies	0.165	0.372
Used the fax to order supplies	0.152	0.361
Used the post box to communicate with key constituencies	0.726	0.447
Used the post box to order supplies	0.095	0.294
Used the computer to communicate with key constituencies	0.414	0.494
Used the computer to order supplies	0.414	0.494
Used the Internet to communicate with key constituencies	0.681	0.467
Used the Internet to order supplies	0.681	0.467
Sent SMS or text messages for business purposes	0.038	0.192
Received SMS or text messages for business purposes	0.031	0.176
Used the Internet for business purposes	0.318	0.467
Usage index	6.592	3.665

TABLE 8
ICT possession, usage, and intensity index means by industrial sectors

Industrial Sector	Possession	Usage	Intensity
Agriculture, forestry, and fishing	4.777	6.000	1.197
Manufacturing	6.384	9.538	1.480
Whole and retail trade, transportation and storage	3.551	5.298	1.611
Accommodation and food service activities	6.222	9.666	1.560
Information and communication, financial and insurance	5.857	8.714	1.481
Real estate, professional and administrative services	5.312	7.750	1.476