



ICT skills readiness for the emerging global digital economy among small businesses in developing countries

Case study of Botswana

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Abstract

Purpose – The paper aims to present the findings of an empirical study carried out as part of an ICT (Information and Communications Technology) data-gathering exercise that would culminate in the promulgation of a national ICT policy for Botswana. The purpose of the study is to characterize the ICT sector in terms of, among other things, the skills needs in the sector for the purpose of powering the emerging digital economy. Moreover, the study – through review of literature – extends, to cover the status of ICT skills for the digital economy both in developed and developing countries.

Design/methodology/approach – The study used qualitative design. Focus group discussions were used to collect data from key stakeholders in the ICT sector. The stakeholders included: ICT enterprises, Citizen Owned IT companies lobby group (CORBIT), Botswana Telecommunication Corporation, Botswana Power Corporation, business community, academia, and legal experts. Data collected were analyzed using thematic categorization. Results were presented using descriptive and narrative form.

Findings – The findings generally suggest that there is an acute global shortage of high skilled and hands-on personnel necessary for steering the emerging digital economy in both developed and developing countries including Botswana. In addition, there is a serious skills gap for certified specialists to help develop the sophisticated applications necessary to power the digital economy and more so the applications that depend on it.

Research limitations/implications – The empirical part of the study was limited to the ICT sector of the economy in Botswana. A similar study covering all sectors of the national economy will provide a complete picture of ICT skills needs for the nation and its preparedness to partake in the emerging digital economy.

Practical implications – ICT, particularly the internet, is having a significant impact on the operations of business enterprises and is claimed to be essential for the survival and growth of nations' economies. Botswana Government has realized the folly of depending largely on diamond mining for long-term economic development. Consequently, it is encouraging the development of the ICT sector as a way to diversify its economy and position itself to play a leading role in the global emerging digital economy.

Originality/value – This study provides a framework for ICT skills development strategies that can enable countries to participate competitively in the emerging digital economy.

Keywords Economics, Communication technologies, Skills, Internet, Electronic commerce, Botswana

Paper type Case study



Introduction

The importance of information and communications technologies (ICTs) as powerful tools for socio-economic development is now widely acknowledged not only among large corporations but small business enterprises as well. However, for ICT to be effectively deployed as engines of economic development existing IT skills gap both in developed and developing countries must be addressed. The Digital Opportunity Task Force (DOT FORCE, 2002) emphasize human resources development through systematic training and education as critical if countries have to reap digital dividends. Additionally, pervasive use of ICT in the economy depends on well-trained human resources for developing relevant applications, supporting and maintaining systems. Moreover, investment in human capital, research and development is becoming increasingly recognised as a critical factor in preparing citizens to participate in the digital age. The International Labour Organization (ILO, 2001) states that countries with the right mix of skills stand a better chance of becoming important locations in global markets. However, for maximum gains to emerge, the development of essential ICT skills is necessary because without such skills, the technologies can neither be maintained nor adapted to local use. The promotion of education and literacy in general and digital literacy in particular, remains a major challenge facing most countries especially those in the developing world. ILO (2001) observes that adoption of ICT in business environments creates two types of skill needs. The first is related to the variety of foundation skills such as the ability to communicate, analyze and solve problems. The other skills relate to technical component which extends beyond the ICT sector to the economy as a whole.

Small and medium-sized enterprises (SMEs) are often seen as vital for the growth and innovation of dynamic economies as they help to diversify economies and at the same time create employment (Machacha, 2002, p. 277). The Organization for Economic Co-operation and Development (OECD, 2000) points out that that small and medium-sized enterprises are fundamental for the economic growth in its member countries and constitute over 95 percent of enterprises. Similarly, SMEs account for 60 percent to 70 percent of jobs in most developed and developing countries and for most new jobs that are created. Within Africa, countries such as South Africa, Egypt, Morocco, Kenya, Uganda, Botswana and Tanzania have prioritized their investment in SMEs (Gordon, 2003, p. 15; Maksoud and Youseff, 2003, pp. 1-15; Republic of Botswana, 2003).

There is no acknowledged universal definition of Small and Medium-sized Enterprise (SME). For example, OECD (2002) defines SME an enterprise with less than 500 employees. On the other hand, the South African SME Act defines SMEs as an enterprise having up to 100-200 employees or 5 million Rand turnover (Gordon, 2003). In Botswana, the government defines SME as registered firm (licensed by government to operate), with less than 100 employees (Briscoe, 1998, p. 32).

ICT skills readiness in the developed world

The developed world is increasingly leveraging ICT in small business enterprises for socio-economic development. However, shortage of ICT skills is causing great concern.

Europe

In most European countries such as the UK, France, Turkey and German, small businesses account for more than 60 percent of the mainstream economic activity

(Ntsala, 2000, p. 171). In Turkey, for example, SME and micro enterprises represent 99 percent of the number of companies, 75 percent of employment and 46 percent of business turnover (Gungen, 2003). In the Nordic region, countries have flourishing economies that are buttressed by family owned business falling in the category of small to medium-sized enterprises (Southern African Entrepreneurship and Small Business Association, 2002, pp. 28-29).

Though the use of ICT to enhance business growth in Europe is top on governments' development agenda, skills shortage remains the greatest obstacle. Mizzi (2004, p. 15) points out that within the European Union, it was estimated in 2000 that there was a shortfall of 700,000 IT specialists, and this number was expected to rise to 1.3 million by the close of 2003. Consequently, European Union member states engaged in various measures to address the negative impact of ICT skills shortage. These measures included but were not limited to advocating for the usage of structural funds in the implementation of widespread internet access and the training of teachers in Internet literacy; re-skilling of the workforce to be able to operate in an increasingly ICT business environment; and putting in place initiatives such as e-learning and online public services. Moreover, the EU member states have put top on their development agenda, capacity building strategies through investing in skills development because of the realisation that a shortage of ICT skills is creating a barrier for fully seizing employment potential within the region.

Furthermore, the EU member states are implementing among other programmes, a European diploma in basic digital skills to stimulate uptake of certified training. Moreover, member states are promoting network of learning and training centres for demand driven information and ICT (eEurope + , 2003, p. 16). Similarly, all universities in the member states are expected to offer online access to students and researchers in order for them to maximise the quality and efficiency of learning processes. Ramsay *et al.* (2003, p. 252) in a study of Irish cross border e-opportunities of small scale businesses established that among the human resource problems faced is the lack of awareness about the potential of ICT and skills needed to use information and communication technologies. The problem of ICT skills is reflected for example, in the fact that some businesses set up web sites, but lacked the understanding about what the web can do to help increase productivity, expand the business, and streamline operations.

Hwang (2004), in a study of the relationship between the diffusion of ICTs and changes in skills in the UK within business organizations, found that education and training were important in adjusting skill changes to the rapid expansion of ICTs. Similarly, in Turkey, the government has undertaken to create awareness about the benefits of accessing the right information at the right time via the Internet (Gungen, 2003). Likewise, in Malta, the government is collaborating with the private sector to accelerate and upgrade initiatives that are aimed at providing widespread digital literacy and producing a crop of much-needed IT specialists (Mizzi, 2004, p. 15). One such collaborative initiative is the widespread programme for the dissemination of PCs in schools, starting from the primary grades that commenced in 1995. On the other hand, in Italy, training in new technologies in the workplace in 2002 was limited and only one worker in five had basic ICT skills. The skill shortage was even more severe in advanced technical areas such that an estimated 60,000 jobs went unfilled in 2002 (Stanca, 2002). The government of Italy has responded by initiating computer literacy

project for all government employees aimed at equipping 400,000 teachers with digital skills. Moreover, an e-learning initiative has been put in place to enable government employees to acquire various ICT skills needed to operate in an e-government environment.

North America

In Canada and the USA, the SMEs sector is responsible for the significant proportion of new jobs that are created. For example, in 2003, there were about 2.2 million SMEs in Canada employing half of the private sector labour force. Similarly, in the USA, small businesses account for more than 60 percent of the mainstream economic activity (Ntsala, 2000, p. 171). As far as ICT is concerned, the Canadian government recognises the important role played by education and training in digital literacy for the purpose of reaping the benefits of ICTs. Emphasis is consequently placed on creating awareness and knowledge of how ICT can be utilised to access information and services. Moreover, appropriate education is emphasised for empowering the population to adapt and shape ICT in order to create new content, or seek specialised employment in the ICT sectors (Consulting and Audit Canada, 2004, p. 34). Furthermore, the government in partnership with the private sector launched the Student Connection Programme in 1996 to hire and train university and college students as business advisors to small businesses. The Programme provides practical onsite information technology training tailored to meet the needs of everyone from the beginner to the advanced user. Through the Programme, companies are expected to develop a better understanding of the value of incorporating electronic commerce in their day-to-day business activities (Consulting and Audit Canada, 2004, pp. 31-32).

The ICT skills gap in developed countries it would seem is more acute amongst small scale businesses. A study of the e-readiness of small business enterprises in the agricultural sector in Canada found that though e-commerce was an important component of e-readiness, a very small fraction (6 percent) was using the internet for e-commerce (Agriculture and Food Canada, 2001). The non-use of the internet was attributed to the low level of knowledge, which prevented most firms from realising the benefits of e-commerce. In addition, the study findings revealed that complex technology and the lack of skills were barriers to the adoption of e-commerce.

ICT skills readiness in the developing world

Awareness about the importance of ICT skills for empowering small businesses in developing nations among governments is growing. Bhatnagar (1992) observes that existing research on IT transfer to developing countries has recognized the need to develop a skilled workforce to learn from the mistakes of other countries. ICT skills problems in developing countries like in developed countries are more severe in small-scale enterprises than in large corporations.

Asia-Pacific

Thriving economies of Asian countries such as Taiwan, Singapore, Thailand, and Malaysia, have largely been enhanced by SMEs (Southern African Entrepreneurship and Small Business Association, 2002). With respect to the role of ICT for economic development, a study of e-readiness of small scale businesses in the Asia-Pacific Economic Cooperation (APEC) countries of Singapore, Thailand, Philippines, Hong

Kong, Indonesia and Malaysia found that amongst the principle obstacles facing small business enterprises seeking to globalise, included lack of knowledge, insufficient management expertise, and training (Lee *et al.*, 1994, p. 6). Similarly, an annual global survey of e-readiness of top ranking 64 nations in 2004 indicated that though India and China were some of the world's biggest economies with world-class cadre of software programmers, booming outsourcing industries and the world's fastest growing internet populations, they performed poorly in the global e-readiness rankings because of among other factors, high levels of illiteracy that prevented them from gaining the critical mass of e-readiness (Economist Intelligence Unit and IBM Corporation, 2004).

The Department of IT eTechnology Group (India) (2003) in India pointed out that there are many factors which, together, can lead to the e-readiness of a country with the most critical being citizens. The citizen component comprises skill sets of people in the nation, literacy levels, and positive attitude towards adoption of ICT. To cater for the people factors in e-readiness, demands an assessment of the various training programmes in order to adopt those that enhance the utilisation of ICTs.

The Caribbean

In the Caribbean, several small business enterprises have grown and expanded into international markets by largely using ICT, raising the quality of their products, improving customer service and enhancing information access and flow. In Jamaica, for example, there is increasing use of ICT in business sector that is attributed to increased awareness and the dramatic declining global costs of hardware and software (Southwood, 2004). Similarly, the government of Trinidad and Tobago released a national ICT plan in 2004 which sought among other things to enable SMEs become e-businesses for them to compete in arenas that were traditionally open only to larger players (Houng, 2004). Moreover, within the Caribbean, there is increasing use of ICTs in small business enterprises and governments are willing to invest in education to enhance manpower development for the digital age. For example, in Jamaica the increased use of ICT has been attributed to the growing awareness (Southwood, 2004). On the other hand, in Trinidad and Tobago, the government expenditure on education, was estimated at US\$ 250 –US\$ 325 per capita in 2000 placing it in the top half of the world ranking countries for public expenditure on education (Maitlamo, 2004, p. 31).

Africa

In most parts of Africa like in developed and transitional economies, there is growing impetus for the creation of strong small business sectors as engines of economic growth, supported largely by international lending agencies. For example, Christianson (2004, p. 47) points out that micro and small-sized enterprises employ more than 40 percent of all new entrants to the labour force because they tend to be more labour-intensive than large firms and thus better placed to mop up unemployment. Muuka (2002, p. 1) on the other hand, notes that the informal sector in Africa is huge due to the large numbers of employees it absorbs as a consequence of inadequate jobs and opportunities in the formal sector. The informal sector in Africa is estimated to employ from three to six times the number of employees in the formal sector. Informal sector is the portion of a country's economy that is outside regulatory environment and whose activities are hardly reflected in official statistics on economic activity. With regard to use of ICT to enhance business growth, Africa ranks lowest

with respect to human capital as far as ICT skills development is concerned among counterparts in the world for various reasons. Maksoud and Youseff (2003) in a study of the use of ICTs in small businesses in Egypt found that lack of awareness was a critical barrier to the implementation of ICT amongst business enterprises. The government of Egypt has made attempts to include computer learning in most schools and universities in order to create a skilled base of entrepreneurs. Similarly, Rizk (2004) in study of e-readiness of the business sector in the agricultural sector in Egypt found that unqualified personnel followed by the lack of awareness were the top-most barriers that hampered the use of ICTs in these firms.

Within Southern Africa, governments now recognize the critical role played by small enterprises as sources of most new jobs. Consequently, collaborative efforts have been initiated to enhance the growth of the SMEs sectors (Chidzomba, 2002). As far as use of ICT in business enterprises is concerned, the importance of requisite ICT skills is widely acknowledged. The Southern African Development Community (SADC, 2002) e-Europe + (2003, p. 2) in a review of the e-readiness of Southern Africa countries pointed out that a paradigm shift was needed in social attitudes and skills levels, vis-à-vis technology within most communities both urban and rural and within both private and public sector organizations. Moreover, the Task Force emphasized that SADC member states needed to implement innovative projects to increase awareness and usage of ICTs in everyday life. The Report of the Task Force pointed out that tertiary education needed to be further developed at both local and regional levels in order to foster and grow ICT skills base within the region. Furthermore, national educational policies needed to emphasize ICT literacy including curricula reform while entire communities needed to be exposed to the benefits of ICT. On the whole, the Report pointed out that the region suffered from the lack of strong foundation for the development of local ICT skills.

Botswana, like many other developing countries, faces the challenges of unemployment and poverty and for this reason, the government and donor agencies are increasingly emphasizing the key role that small business enterprises can play in promoting economic and social development. The government of Botswana is looking for investment in ICT as a means to of diversifying its diamond dependent economy (Machacha, 2002, p. 277). A study undertaken by Consulting and Audit Canada in 2004 aimed at promulgating a national ICT policy for Botswana found that among the major problems facing the ICT sector included limited skilled human resources (Maitlamo, 2004, p. 6). The study findings further revealed that access to adequate and highly skilled human resources were crucial to ICT sector development yet, there were no PhD level employees in any of the companies that were surveyed. The Report noted that PhD level entrepreneurs combine in-depth knowledge with research and business skills that were the cornerstone for innovative thinking and developments around the world.

Methodology

The study applied qualitative method with focus group discussions as the data collection procedure. The study population consisted of key stakeholders within the ICT sector in Botswana who included Botswana Telecommunication Corporation, Botswana Power Corporation, business community, academia, researchers and legal experts. The use of the focus groups provided a unique opportunity to consult far and

wide amongst stakeholders in the ICT sector. Botswana ICT sector was at the time of the study having 114 ICT companies listed on the government of Botswana web site (Government of Botswana, 2004). Through the Department of Information Technology of Botswana (2005), all companies and stakeholders in the ICT sector were invited on diverse dates in focus group discussions. In all, 55 companies from the ICT sector attended the focus group meetings resulting in a response rate of 34.5 percent. Table I shows groups with whom discussions were held.

Each of the focus group discussions consisted of between 20-30 members. The duration of each focus group lasted between 1-2 hours. Prior to the commencement of each group discussion session, participants were asked to register by providing the following information; personal name, company name, address of the company, core business/any other business, and number of employees in the company. This information was necessary for follow-ups. Each session was preceded by a facilitator of the national ICT policy initiative, who explained the purpose of the meeting. The respondents were informed that they were invited to provide their views on various issues including ICT skills needs that would help in assessing Botswana's preparedness to participate in the emerging digital age. During the focus group discussions, one of the authors participated as one of the three recorders of the proceedings. All the focus groups followed the same questions guide. After each group session, the recorders compared the reports and summarized the findings.

Data analysis and discussion findings

The data collected were grouped in thematic categories and analyzed. The analysis involved examination of data under each theme for recurring relationships and correlations. Key themes emerging are discussed below.

ICT professionals needed most

From the discussions with respondents, it became apparent that the greatest demand for ICT skills was in the decreasing order of priority: network engineers, IT support and maintenance staff, software engineers, and telecom engineers. The demand for network engineers perhaps underlines the necessity of networking in organizations because of the need to share information as well as ICT resources. On the other hand, the high demand for IT support and maintenance is in agreement with the findings of Mutula (2005) in study of e-readiness of SMEs in the ICT sector in Botswana revealed that core activities to be in the area of maintenance and repair; hardware and software sales; software development; assembling, networking and cabling. Likewise, demand for software engineers could be attributed to prevalence of software sales; software development; pervasiveness of Microsoft applications. The demand for telecom engineers on the other hand, perhaps reflects the increasing importance of telecommunications as the fastest growing ICT sector worldwide.

The other areas that were highlighted in the discussion groups where ICT skills demand is high included; programmers, and analysts; technicians and web designers. The high demand for programmers/analysts could be attributed to the fact that programmers and analysts in Botswana are trained to do tasks of both analysis and programming. Similarly, the demand for technicians is perhaps to the fact that this cadre of staff is needed to provide support for hardware and software components and also carry out repairs and assembling work which dominate businesses of the ICT

Table I.
Focus groups

Focus group name	Focus group description	Venue	Date	Participants from ICT sector (Nos.)
Business and industry	Business community	Tlotlo Centre, Gaborone	16 Sep, 2004	Nine (9)
Government utility bodies	BPC, BC and BTA	Tlotlo Centre, Gaborone	16 Sep, 2004	Seven (7)
Policy and legal experts	Representatives from AG's office	Tlotlo Centre, Gaborone	17 Sep, 2004	Eight (8)
Botswana IT Society (BITS)	IT professionals	Department of IT, Gaborone	18 Sep, 2004	Ten (10)
Citizen IT-owned firms	Citizen-owned companies	Tlotlo Centre, Gaborone	21 Sep, 2004	Ten (10)
Education and research	Educators and researchers	Tlotlo Centre, Gaborone	24 Sep, 2004	Eleven (11)
				Fifty-five (55)

sector in Botswana. Moreover, technicians are regarded as jacks-of-all-trades in the ICT sector in Botswana. In addition, SMEs due to their small size do not often have the capacity to hire and retain high skilled staff. The demand for web designers, perhaps points to the increasing importance of websites as means of communication amongst business organizations. Moreover, websites enhance visibility and serve a marketing function to businesses. Against expectations, IT security skills did not feature prominently among the highly sought skills in the ICT sector in Botswana. This finding perhaps suggest that ICT firms in Botswana are yet to invest sufficiently in this type of skill or do not appreciate the import of security of information within their organizations. In general, the shortage of key ICT skills does not augur well for Botswana if it has to leverage ICTs to enhance its competitive advantage especially in the international market and also if it expects to become an ICT and financial services hub for the region as envisaged by government (Maitlamo, 2004).

ICT capacity-building strategies

Discussion with respondents revealed that most business enterprises especially large corporations encouraged their staff to acquire ICT-related skills through continuing professional development; seminars, workshops; on-job training and refresher courses. However, no deliberate ICT capacity building strategies were available in the enterprises. Gray and Lawless (2000) in a UK study of small business enterprises found that the smallest firms were, on balance, generally averse to adopting a formal staff development policy. They attributed this to a number of external factors, such as the scale effects on resources. They observed that most small firms allocated formal development policy a low priority whereas the majority of large firms felt that staff capacity building should have a high priority. Furthermore, formality, planned and even successful nature of staff development appeared to be linked to the complexity of the business. Firms with written, explicit staff development policies were more likely to benefit from most forms of training.

Adequacy of ICT skills

Results from the discussions revealed that in small enterprises, ICT skills needs were largely sufficient especially with respect to: seeking information on the internet; file organization; information processing and e-mail communication. However, concern was raised about certain skills shortage. For example, some respondents had this to say about skills shortage:

Often, we seek expatriate skills from outside Botswana to meet our demand; we lack managerial and technical expertise in our firms; there is limited number of IT professionals in the country especially web designers and network managers; specialized skills in MSCE and Oracle are in short supply; we have short supply of content managers and telecommunication engineers. Moreover, respondents observed that: whereas there are many ICT related degree holders in Botswana, they lacked ICT experience; there is management top-heavy while at the lower level, there is ICT skills shortage with no doers or hands-on people; We get expertise from outside Botswana to service our needs; we have shortage of CISCO skills in our firms so whenever we need this type of skill we normally outsource from outside Botswana; at middle level management, most staff do not have hands-on experience; though there are various ICT skills in Botswana such as systems analysts, programmers, MSCEs, oracle specialists, and database designers, they lack hands-on experience to meet our needs.

The importance of developing necessary ICT skills for the digital economy need not be over-emphasized. World Summit on the Information Society (WSIS) Civil Society Working Group (2004) observes that it is important to ensure adequate development of human capacity in order to fully exploit the benefits of ICTs. Similarly, McConnell International (2000) notes that the world faces an incredible need for ICT skills, and shortages are greatest in four areas: managers capable of completing complex technology projects; policy analysts who understand government; local content creators, software, hardware and communication engineers.

Qualifications and prior ICT experience of CEOs

Discussions with respondents showed that most Chief Executive Officers (CEOs) were certificate and diploma holders. ICT companies tended to employ certificate holders either because they were cheaper or the businesses undertaken did not warrant high skilled personnel. The results from the discussions further suggested that there was lack of well-qualified managers within the ICT sector in Botswana. Similarly, there were a small number of certified specialists among the companies surveyed, suggesting that there were a few specialists to help develop the sophisticated applications necessary to power the digital economy. The small number of certified ICT specialists could also be attributed to among other factors high cost of hiring them and a shortage of such staff in the local market. Moreover, it is possible that SMEs are unlikely to have the financial capacity to recruit and retain highly skilled ICT expertise. Southwood (2004) notes that there is a shortage of ICT skills in Botswana across a wide range of fields. For example, there is a shortage of citizens who have management experience or who are entrepreneurial.

Price (2003) points out that in the UK, small enterprises without the buffers of their larger corporate cousins, rely on the collective skills of their workforce for business performance and more so for IT user skills – the fourth basic skills alongside communication, literacy and numeracy. Moreover, findings of an e-skills study of IT user skills in the workplace in the UK demonstrated very worrying gaps for employers. The study found that many employees lacked sufficient IT user skills to perform effectively in their roles, thus impacting negatively on business productivity. ICT skills constraints can influence negatively company performance by restricting the use of IT for the benefit of enterprises. For example, if users are not aware of viable IT shortcuts to business operations such as customer ordering or document creation and presentation, it will take them longer to produce a professional piece of work. Furthermore, poorly skilled IT users might make up more errors than well-trained peers.

ICT awareness among staff

Discussions revealed that staff in general, demonstrated a good level of awareness of using ICT for business transactions. Some of the respondents had this to say:

[...] within our firm, an understanding of the value added potential of ICT-based solutions is growing; in our company, the level of ICT awareness is good; For our staff ICT awareness is quite high since our staff are specialists and professionals in ICT; the staff understand the value of information for business management.

Rizk (2004) in a study of the e-readiness of SMEs in the textile sector in Egypt found that limited awareness came as a top barrier to implementing ICTs. Similarly, Ramsay

et al. (2003, p. 253) noted that small business enterprises do not understand the ways in which the internet can enable them to operate their businesses more efficiently and cost effectively. The high level of ICT awareness amongst enterprises in the ICT sector in Botswana can perhaps be attributed to the fact that the staff employed in those ventures are professionals who inevitably understand the important application of ICTs for business operations. However, there was little understanding amongst staff of the potential of e-commerce for their enterprises. Schmidt (1998) in discussing business enterprises in the OECD member States, notes that, although firms increasingly use the internet for a variety of commercial and production related purposes, they typically reveal a limited understanding of the complexity of e-commerce. This could be the result of lack of awareness of e-commerce potential, inadequate ICT skills and the lack of strategic planning of the long-term development of their businesses. Similarly, in the UK, Sector Skills Development Agency (UK) (2004) notes that awareness; attitudes, capabilities and investment are important issues in ICT take-ups by enterprises. Moreover, many small businesses may not derive maximum benefits from ICTs due to their relative lack of knowledge and resources, including skills that they need to become expert purchasers and appliers of new technology.

Attitudes of staff towards ICTs

Discussions revealed that within small-scale enterprises, attitudes towards ICTs were largely mixed. This was what some respondents had to say about attitude towards ICTs:

The attitude of our staff towards ICT is not very encouraging; Our staff's motivation is low due to the lack of opportunities for promotion; the attitude of the staff is positive and encouraging; it is difficult to tell whether the attitude of staff towards use of ICT is positive or not because our staff use ICTs in their work; our staff are trained in ICT so they have no problem with its use; some of the staff are not well motivated towards ICTs while others are.

Rogers (1995) noted that staff inclinations towards ICT use is a critical component of ICT diffusion in organizations.

The mixed reactions amongst staff about attitude towards ICT in Botswana could arise from the fact that within business enterprises, not all staff needed to have ICT skills because the core ICT chores were largely integrated with non ICT-based activities. On the other hand, in cases where most focus was on ICT, most staff was either IT professionals or they had competencies and an understanding of ICT issues. Dagdilelis and Satratzemi (2003) in a case study of a nationwide system for training small business enterprises for ICT innovation in Greece found that the employees in many cases did not have positive attitudes towards ICT. They noted that the particular characteristics of enterprises and also of the staff had an effect on the attitudes towards ICTs, especially the necessary knowledge to deal with a variety of situations that they could encounter in the various enterprises.

Adequacy of technical support

Discussions revealed that in general, technical support was adequate for some firms, while for others it was not. This was what some respondents had to say about technical support:

... in our firm, technical support is relatively good; for us, hands-on expertise is rather limited; we really don't have expansive ICT infrastructure and therefore do not require highly skilled staff; it is expensive for us to hire all aspects of expertise that we require so we do with what we can afford.

Some respondents also pointed out that they experienced shortage of specialized ICT skills but were often able to recruit from outside Botswana.

Level of ICT usage by staff in the ICT sector

Discussions revealed that ICT usage was generally high. This was what some CEOs said about ICT usage by their staff:

[...] the usage of ICTs by our staff is very high because this is our core business and we have no complaints.

The high usage of ICT could probably be attributed to the fact that ICT was their tool of work. Department of Enterprise, Trade and Employment (Ireland) (2005) in Ireland found that while, larger companies tended to make more sophisticated use of ICT than smaller companies, poor integration of IT systems throughout business also appeared to be an issue for large companies. For example, relatively low levels of ICT usage by European companies, was found to be a contributing factor to the failure of Europe to catch up with productivity growth rates of the USA.

Conclusion

The purpose of this study was to characterize the ICT sector in Botswana and in particular determine ICT skills sufficiency in the country. The study findings have in general shown that low level ICT skills needs are largely met by SMEs while specialized certified qualifications are scarce. Moreover, the study findings have revealed that larger firms which are largely foreign owned are more likely to have much greater ICT capacity than small locally owned firms. Though this study was carried out in 2004 and made appropriate recommendations, little has changed on the ground in terms. On the positive side though, this study in part formed the basis for countrywide assessment of e-readiness of the economy in Botswana during 2005 that would culminate in the national ICT policy for Botswana. Moreover, government is considering putting in place an immigration policy to address issues of critical skills shortage in Botswana. Additionally, the national ICT policy is at the time of writing this paper before parliament for enactment. It is hoped that once the ICT policy is promulgated, it will address issues of skills shortage that have been raised in this paper.

However, a lot still remains to be done to empower SMEs in Botswana to effectively apply ICTs. A number of steps are therefore needed to equip SMEs in Botswana with the ICT capacity for them to play a competitive role in the global internet commerce. Firms need to put in place explicit staff development policies that focus on ICT capacity building in the area of content development, software, hardware and communication support. Similarly, SMEs should be encouraged to integrate information management function with the business strategy in order to enhance information use, creation, storage and dissemination for competitive advantage

The government on its part should consider, establishing effective procurement of human, technical and financial resources as well as enhancing research and development capacity in order to meet the technology needs of SMEs. Similarly,

Government should put in place that requires international companies to work with local companies for the purpose of technology and skills transfer. This policy would ensure that the country does not remain dependent on foreign experts. Moreover, a prudent approach to capacity building by government should tailor the immigration policy to welcome skilled high-tech workers from abroad. Similarly, the government could establish a national ICT skills development agency or observatory that would equip young entrepreneurs with skills necessary to operate in an electronic business environment. Government of Botswana could also put in place institutional frameworks that would promote awareness among SMEs about the potential benefits of ICTs for business growth.

Enhancing education with effective application of ICT, both as a classroom tool and a subject in its own right, needs to be considered as one of the priorities of the government of Botswana. Furthermore, it is important to deploy ICT-related skills through traditional education system because most business enterprises provide little or no formal training, and largely they tend to hire qualified staff. The importance of education in support of any national development and ICT agenda cannot be over-emphasized. A sustainable ICT programme that contributes significantly to a country's development stands to be achieved if the workforce is suitably trained and the educational system is able to continually supply skilled, innovative and entrepreneurial professionals. If ICT skills challenges are not addressed urgently, Botswana could lose its economic advantages in the connected world because of the migrating IT specialists, a small IT workforce or the low ratio of ICT graduates.

References

- Agriculture and Food Canada (2001), "The e-readiness of Canadian Agriculture and Food Canada SMEs", available at: www.agr.gc.ca/misb/fb/food/e-commerce/eready/introduction_e.html (accessed 21 March, 2004).
- Bhatnagar, S.C. (Ed.) (1992), *Information Technology Manpower: Key Issues for Developing Countries*, Tata McGraw-Hill, New Delhi, pp. 189-200.
- Briscoe, A. (1998), "Small business support in Botswana" *Friedrich Ebert Stiftung Small, Medium and Micro Enterprises Task Force Report (1998)*, submitted to the Minister of Commerce and Industry, April 1998. Government Printer, Gaborone, pp. 1-68.
- Chidzomba, J. (2002), "Experience on regional networking of SMEs in the case of Small Enterprise Promotion Advisory Council [SEPAC]", paper presented at seminar on Promotion of SMEs in Angola – Experiences and Lessons Learned, August 7-10, 2002, Luanda, Angola, available at: http://spesmrui.intnet.mu/sepac/luanda_paper.html (accessed 11 August, 2004).
- Christianson, D. (2004), "ICSB – much more than just a talk shop", *Enterprise*, July, pp. 47-8.
- Consulting and Audit Canada (2004), "Transformation for the digital age: the development of Botswana's National ICT policy", *Preliminary Report for Consultancy for the Formation of a National Information and Communication Technology Policy Technical Bid*, Government of Canada, Toronto, pp. 1-81.
- Dagdilelis, V. and Satratzemi, M. (2003), "Implementing a nationwide system for training very small enterprises for ICT innovation: the Greek case", *Educational Technology & Society*, Vol. 6 No. 1, available at: http://ifets.ieee.org/periodical/vol_1_2003/dagdilelis.html (accessed 5 March, 2005).
- Department of Enterprise, Trade and Employment (Ireland) (2004), *E-Business Strategy*, available at: www.entemp.ie/enterprise/support/ebusinessstrategy.htm (accessed 4 March, 2005).

- Department of Information Technology-Botswana (2005), "National ICT policy will cost about a billion pula in five years: the roadmap is in place", *Botswana Digital News*, Vol. 3, February, pp. 1-3.
- Department of IT eTechnology Group (India) (2003), "Assessment of central ministries and departments", *E-governance Readiness Assessment 2003: Draft Report* 48, New Delhi.
- DOT FORCE (2002), "Digital opportunities for all: meeting the challenge", *Report of the DOT Force*, 11 May.
- Economist Intelligence Unit and IBM Corporation (2004), "Scandinavia consolidates lead in fifth annual Economist Intelligence Unit e-readiness rankings", available at: www.store.eiu.com/index.asp?layout=pr_story&press_id=1260000726 (accessed 16 April, 2004).
- e-Europe + (2003), *A Cooperative Effort to Implement the Information Society in Europe: Action Plan*, European Commission, Lisbon, pp. 1-32.
- Gordon, G. (2003), "SME survey", *Sunday Times Business Times*, p. 15.
- Government of Botswana (2004), "Download list of citizen owned companies", available at: www.gov.bw/business/tenders.html (accessed 17 July, 2004).
- Gray, C. and Lawless, N. (2000), "Innovations in the distance development of SME management skills", available at: www.eurodl.org/materials/contrib/2000/gray.html (accessed 4 March, 2005).
- Gungen, T. (2003), *E-finance for SMEs in Turkey: Yapi Kredi Bank*, available at: http://r0.unctad.org/ecommerce/event_docs/xmefinoc2001/gungen.pdf (accessed 27 November, 2003).
- Houng, M.H. (2004), "Trinidad and Tobago national information and communication technology plan", *INASP Newsletter*, available at: www.nict.gov.tt (accessed 22 April, 2004).
- Hwang, G. (2004), "Diffusion of information and communication technologies and changes in skills", available at: www.emcc.eurofound.eu.int/content/source/uk02010s.html?p1=sector&p2=Information_Technology (accessed 27 August, 2004).
- ILO (2001), "Life at work in the information economy", *World Employment Report 2001*, available at: www.ilo.org/public/english/support/publ/wer/overview.htm (accessed 11 March, 2004).
- Lee, C.J., Chi-Keung, L. and Hwang, T.S. (1994), *The APEC Survey on Small and Medium Enterprises*, APEC Secretariat, Singapore, pp. 1-15.
- McConnell International (2000), *Risk E-business: Seizing the Opportunity of Global E-readiness*, available at: www.mcconnellinternational.com/ereadiness/EreadinessReport.htm (accessed 14 September, 2004).
- Machacha, L. (2002), "Impact of information technology on small and medium enterprises (SMEs) in Botswana", *Proceedings of International Conference, Port Elizabeth, South Africa, April 3-6, 2002*, pp. 277-82.
- Maitlamo (2004), "ICT sector survey in Botswana", *Report of National ICT Consultancy for Botswana*, Consulting and Audit Canada, Gaborone, pp. 1-68.
- Maksoud, S.S. and Youseff, M.A.A. (2003), *Information and Communication Technology for Small and Medium Enterprises in Egypt*, SME Development Unit-Ministry of Foreign Trade, Cairo, pp. 1-15.
- Mizzi, J. (2004), *Organisation and Cultural Transformation: The Malta Experience*, MITTS, Blata-Baida, pp. 1-93.
- Mutula, S.M. (2005), "Assessment of the e-readiness of small and medium-sized enterprises with respect to information access", PhD thesis, University of Johannesburg, Johannesburg, p. 426.

- Muuka, G.N. (2002), "Africa's informal sector matters: a challenge to scholars to close the knowledge gap", *Proceedings of International Conference, Port Elizabeth, South Africa, April 3-6, 2002*, pp. 1-6.
- Ntsala, M. (2000), "Information delivery systems for small business", *Proceedings of 1st Biannual DISSAnet Conference, Pretoria: The Centre for Information Development, University of Pretoria, 26-27 October, 2000*, pp. 167-76.
- OECD (2000), *OECD Study Highlights Role of Small and Medium Enterprises in Job Creation*, available at: www1.oecd.org/media/publish/pb00-11a.htm (accessed 8 August, 2004).
- OECD (2002), *Measuring the Information Economy*, available at: www.oecd.org/document/5/0,2340,en_2649_34449_2765701_1_1_1_1,00.html (accessed 21 January, 2004).
- Price, K. (2003), *IT User Skills in SMEs*, available at: www.trainingreference.co.uk/skills/it_user/it_user_skills.htm (accessed 5 March, 2005).
- Ramsay, E., Ibbotson, P., Bell, J. and Gray, B. (2003), "E-opportunities of service sector SMEs: an Irish cross-border study", *Journal of Small Business and Enterprise Development*, Vol. 10 No. 3, pp. 250-64.
- Republic of Botswana (2003), *Budget Speech 2003*, Government Printer, Gaborone.
- Rizk, N. (2004), *E-readiness Assessment of Small and Medium Enterprises in Egypt: A Micro Study*, American University, Cairo, available at: www.sba.luc.edu/orgs/meea/volume6/Rizk.htm (accessed 9 August 2004).
- Rogers, E.M. (1995), *Diffusion of Innovations*, 4th ed., The Free Press, New York, NY.
- SADC E-readiness Task Force (2002), *SADC E-Readiness Review and Strategy*, SADC, Johannesburg, p. 1060.
- Schmidt, J. (1998), "Enhancing the competitiveness of SMEs in transition economies and developing countries in the global economy and their partnership with SMEs of OECD countries", available at: www.conferenzabologna.ipi.it/Eng/dopo_la_conferenza/documenti/WK4_eng.pdf (accessed 1 March, 2005).
- Sector Skills Development Agency (UK) (2004), *Skills for Business*, available at: www.ssda.org.uk/ssda/Default.aspx?page=740 (accessed 3 March, 2004).
- Southern African Entrepreneurship and Small Business Association (2002), "The promotion of small business in SADC", *Traders. Journal for the Southern African Region*, Vol. 8, October, pp. 28-9.
- Southwood, R. (2004), "The impact of ICT on SMEs – a motor for future economic growth in hard-pressed times", *Balancing Act News Update*, No. 192, available at: www.balancingact-africa.com/news/current1.html (accessed 26 January, 2004).
- Stanca, L. (2002), "Government guidelines for the development of the information society in Italy", available at: www.mininnovazione.it/eng/normativa/documenti/linee_guida_eng.pdf (accessed 15 April, 2006).
- WSIS Civil Society Working Group (2004), "World summit on information society: draft declaration of principles", available at: www.wsis-pct.org/prepcom2-declaration.html (accessed 7 November, 2004).

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