

IT INDUSTRY IN BOTSWANA: CHALLENGES AND OPPORTUNITIES

Priti Jain

Botswana College of Agriculture

e-mail: jainpriti@hotmail.com

ABSTRACT

This paper discusses the IT industry in Botswana in the context of five major findings of recently conducted survey. Looking at the challenges and opportunities facing the industry, the paper provides proposals on what needs to be done by all stakeholders including the government, the private sector and individual institutions to mitigate the challenges facing the industry and build on the opportunities available to enhance IT growth in Botswana.

Keywords: IT environment; Botswana; IT industry; Information technology; IT policy.

INTRODUCTION

Information technology (IT) continues to undergo tremendous development especially in the area of computing and telecommunications. Technological advances in wireless communication especially mobile phones and the Internet are cases in point. Though many developed countries have effectively embraced technology, this is not true of the developing countries and this includes Botswana. The limited IT culture in developing countries can be attributed to a number of factors including economic instability, social priorities and lack of inadequate investments.

Countries that have well developed information and communication technology (ICT) infrastructure are well resourced to participate in the global information society. It is important for any government to explore ways of utilising IT to enhance development (Akolo: 2001). The importance of improving any nation's IT infrastructure to enable it to compete in the global arena cannot be over-stated. IT is important for development across any sectors of any national economy. The globalization of the world economy and the emergent internationalization of goods and services has enhanced the growth of massive multinational companies, which are able to dominate world trade by constantly seeking out cost-reduction opportunities and increased productivity to enhance their competitiveness. These developments are being facilitated and accelerated by the information and communications technology.

Today, trends and practices in IT revolution compel every nation to re-look at its policies and performance in relation to IT. More people now spend more time on

the Internet, many organizations use the Internet to do business and the Internet has created many jobs related to the technology. The Internet has tremendous potential in terms of number of users, number of devices, speed and bandwidth, amount of content and number of applications (Nelson: 2001). The Internet growth is likely to create several jobs and become a major driver in economic development of those countries that have developed infrastructure to encourage access of its people to the Internet.

Within Southern Africa, SADC countries have identified areas that need to be addressed by each of its member states in order to enhance IT development within the region for socio-economic growth. Such areas include but are not limited to equitable access to Information Communications Technology; reducing costs and development of infrastructure. Policy issues are also being addressed such as national information and communication Infrastructure; favorable regulatory environment; liberalization of the telecommunication sector, etc. The development of Botswana's development strategy Vision 2016, envisions the harnessing of IT in order to leverage the country to compete effectively in the global digital economy.

IT INDUSTRY IN BOTSWANA

In Botswana most of the IT sector, especially the Internet and wireless communications, is liberalised. The political stability in the country has encouraged foreign investors and this has helped the growth of the IT industry. The status of IT is good especially when one looks at the number of Internet hosts at 578, number of Internet Users over 5000, number of Internet Service Providers (ISPs) 10 tele-density of 18%. The tele-density of 18% is well ahead of several African countries such as South Africa, Egypt, and Nigeria. This is a great leap from the situation in 1997 when the whole of the SADC region had 151927 Internet hosts, 930100 Internet users, 218 Internet Service Providers (ISPs) and tele-density of 4.8 (Network Wizards <http://www.nw.com>). This growth is attributed to proactive IT policies. The IT policies in place have made IT to be the fastest growing sector in the country. Within Botswana, Internet cafes and tele-centers have sprung up in every city and major towns and this has helped penetration of Internet to the grassroots society. Botswana is one of the 11 countries with more than 20,000 dial-up subscribers and among the 10 having links of 5 Mbps or more against the total International outgoing Internet bandwidth 250 Mbps installed in Africa (Jensen: 2002). However high costs of subscription, connection fee and telephone charges for dial up access remain a major challenge to Internet access in Botswana. The government is however making a tremendous effort to equip all secondary schools with computers. The country has invested heavily in infrastructure development especially telecommunications and has an industrial policy, which emphasises comprehensive science and technology. Botswana has fiber optical backbone across the country, with very small aperture television (VSAT) facility, and a direct link

via satellite to the US providing a platform for users to gain access through Botsgate the Internet gateway. BTC is set to be privatised according to policy passed early this year. Botswana has 100% digital exchanges and has also a microwave linking over 50 automatic exchanges and providing connections to South Africa, Zambia and Zimbabwe (<http://www.btc.bw>). There are two cellular phone companies in Botswana. Botswana Telecommunications Authority (BTA) has since February 2001 granted four private network telecommunications licenses and six data licenses to provide national international data services. As a result, the number of mobile subscribers has increased now from 195 000 as at the end of December 2000 to 314 915 as at the end of Dec. 2001. The BTC has grown marginally, from 132 866 as at the end of December 2000 to 138 242 customers at the end of December 2001. BTC has adopted a new 7-digit numbering system to replace the current six-digit numbering system country-wide, with a view to addressing the telephone number shortages experienced in the major centers. The roll out program of the new system is expected to be completed in 2003 (Gaolathe, 2002:26).

Efforts are being made roll out bring Integrated Service Digital Network (ISDN) infrastructure in the country. ISDN is fast public switched digital technology that offers high communication services such as audio, data, images and video. This technology is good in sparsely populated parts of the country. ISDN offers speed that is 10 times what is offered over the Internet. Hymax technology, which is world-class ISO 9002 standard, is up in Botswana. Botswana Hymax prides itself as Africa's leading-edge voice and data technology companies dealing in Private Automatic Branch Exchanges (PABXs). Hymax offers the total telephone solution - including highly effective Call Centers, Voice Mail and Telephone Management Systems, ISDN (Hymax for voice and data IT networks, 2001).

The IT network of companies operational in the country is quite high. Services and products offered range from repairs of electronic components, logistical support, hardware and software maintenance, systems supply and implementation, network maintenance, training, Microsoft certification, Microsoft solutions provider, software support, project management, IT infrastructure development. The post office in Botswana is also engaged in a project that will see all its 112 post offices in the country computerized (Pule, 2001).

Botswana Stock Exchange has installed a new Central Depository System in order to enhance transparency and enable simultaneous electronic interfacing with brokers, dealers and clients.

The infrastructure for training is also developing fast. Some of the most well known training institutions include, National Institute of Information Technology (NIIT) and IT-IQ a Microsoft Certified Technical Education Centre that provide technical

Jain, Priti

training through the use of Microsoft Official Curriculum training material and Microsoft Certified Trainers.

In the electronic media, Botswana TV station was set up in the year 2000, before then there was no TV station in the country. Another television station Information Television (ITv), was established during 2001 to serve the needs of hotels, retail centers, banks, government parastatal building such as airports, border posts. Content distribution will be by video or Digital Video Disc (DVD). Information Television will explore other means of distribution such as ISDN (Richards, ITV - alternative media: 2001). Many government parastatals are computerised such as Water Utilities, Botswana Telecommunication Corporations, Motor Vehicle registration and licensing, Botswana Power Corporation.

There is increasing involvement of local citizens in the IT industry with the government ready to provide loans for those who wish to establish IT business. Several citizen IT lobby groups are increasingly demanding that tenders be awarded to Botswana owned companies.

The government has made deliberate efforts to provide telephone services to several villages within the country. Most villages with over 500 people have been connected. There has also been extensive rural electrification that should make use of IT products in rural areas accessible (Ministry of Finance and Development Planning, 1997).

Thus, in Botswana, the IT industry is developing rapidly with the rest of the SADC region. However, rural areas are still disadvantaged and this poses challenges to equitable access to information by all citizens. In the light of foregoing scenario, the study was motivated to analyse IT diffusion in Botswana in order to identify constraints and recommend solutions to them so that the IT industry can flourish more rapidly in the country. It was assumed that there was tremendous scope of better IT diffusion in the country.

RESEARCH METHODOLOGY

The questionnaire technique was adopted for this study. Two types of questionnaires were designed, one for training institutions and another for non-training institutions. The questionnaire was piloted and consequently some of the questions were modified. The organisations from which the sample was drawn, comprises 3 public, 14 private, and 6 parastatal (semi-government) sector agencies.

Questionnaires were distributed individually by the researcher and collected in the same way. All data were analysed using Statistical Package for the Social Sciences (SPSS). A total of 100 (90%) questionnaires were collected and analysed.

FINDINGS

(a) Participants

Table 1 shows the demographic profile of the respondents.

Table 1: Respondent’s Profile

Participants:	Public Sector	27%
	Private Sector	27%
	Parastatal	46%
Nationality:	Botswana	48%
	Any other	52%
IT Experience:	0-5 years	26%
	6-10 years	29%
	11 & above	38%
Without IT Experience	Human Resource Management	6%

A majority of the respondents (98%) in the study stated that there is a better scope for IT diffusion in the country.

(b) Major Constraints in IT Diffusion

The major constraints are given in Table 2. The study identified one of the major constraints as lack of skilled and trained manpower in the IT industry. Often, a lack of qualified and experienced IT personnel is seen as a very crucial factor in developing countries, Botswana is no exception. Personnel who are sent for IT courses do not get enough exposure or experience in what they learn. Thus, they are unable to put into practice what they learnt. One participant observed,

“Experience in IT is gained through first obtaining IT based education at tertiary level or by diploma courses. IT career growth paths are effectively achieved by climbing the ladder and not by fitting the job to the qualification, as is often the case in Botswana”.

Table 2: Major Constraints Identified in IT Diffusion

Lack of skilled & trained manpower	53%
Inadequate IT exposure in schools	52%
Lack of National IT policy	47%
Poor communication infrastructure	45%
Ignorance of IT benefits	43%

Emphasising the importance of information and communications technology (ICT), Tlale (2001) pointed out that, "The number of teachers without computer skills is shocking. It is a national scandal that we have so many teachers who are computer

illiterate. Teachers are supposed to be at the lead of technological and social changes because they are purveyors of knowledge. The government has an onerous responsibility to transform teachers and make them computer literate in skills and thinking". He further challenged, "The process of improving the computer skills of teachers is not the sole responsibility of the government. Individual teachers also have the responsibility to undertake self-development. Many teachers have access to private schools that offer computer tuition at a reasonable rate but teachers are not buying computers like cell phones".

(c) IT Exposure in Schools

Inadequate IT exposure in schools was found to be the other setback. There is an immediate need for a review of the current education system with regards to ICT literacy. Otherwise, having IT facilities without optimum usage is like having a car without a driver's license. It is simply an acquisition, not the dissemination, of IT. "Without a suitable education and training program, the recipient of a new technology will never be able to realise the full benefit of the technology, and moreover, will be unable to mold the new tools to fulfill the user's needs" (Gibson, 1998).

(d) Telecommunication Infrastructure

Poor telecommunication infrastructure was found to be a constraint. In Botswana, many schools do not have IT facilities, especially in rural areas. E-mail and Internet facilities are very limited. "Since developing countries have poor communication infrastructures informatics development is paramount to economic development" (Gibson, 1998). Recognising the importance of high speed data communication (HSDC) facility as a critical prerequisite for undertaking a meaningful off-shore computer software projects, the Ministry of Information Technology, India, has set up wide band F-3, IBS earth stations in six major cities of the country, which serve as international gateways (India, 2001). There is an urgent need to improve communication infrastructures in order to make IT accessible to rural areas.

(e) IT benefits

Ignorance of IT benefits was established as the other drawback. Here, it could be argued that since people are unaware of IT benefits, they fear and resist using it. Consequently, they are unenthusiastic to explore/exploit IT facilities as a tool to improve work efficiency and effectiveness. In this situation, Botswanians fail to exploit and adopt IT as a problem solving tool. This limits the extent of IT usage.

A competitive environment plays an important role in IT diffusion. The rivalry among firms, the threat of substitute products, customer service, new entrant threats are all driving forces behind industrial competition, which seems to be missing in Botswana as the findings suggested.

(f) National IT Policy

The absence of a national IT policy is one of the major constraints in IT diffusion in Botswana. The country also lacks a national information infrastructure plan or an academic/research network. Currently, the Research and Development Unit at the University of Botswana, is one of the more active networking agencies in the country. At the same time, IT and training institutions' mission statements do not provide clear and comprehensive statements that indicate commitments to the provision of information technology.

Table 3 summarises the recommendations put forward by respondents from the survey.

Table 3: Recommendations by Respondents

For more IT exposure in schools	55%
For National IT policy	53%
For more IT benefits awareness programs	52%
For improved telecommunication infrastructure	50%
For more IT trained manpower	41%

CHALLENGES FACING IT INDUSTRY

There are several challenges facing the IT industry in Botswana. There is generally a shortage of IT manpower and top posts in both the government and private sector are held by expatriates. There is limited courses offered in IT in schools and as a results, students have limited exposure when they reach university level or other levels of tertiary education

Though there is well-developed infrastructure across the country, it cannot be fully utilised. For example, some areas have no power supply as well as telecommunication facilities. Generally, managers and employees are ignorant of the benefits that can be derived from IT. Computer hardware and software is still highly priced despite falling prices on the international market. The government has not strongly advocated for the adoption and usage of IT in Botswana. Until recently, there were efforts to encourage citizens' investment in IT and the government is encouraging this move by offering loans to open up IT related businesses.

There is a general shortage of IT personnel such as software engineers, systems developers, IT managers, systems analyst, web designers, etc. Most teachers in the country are computer illiterate. Lack of IT skills with such large workforce in the country reflects inadequate pervasiveness of IT in Botswana (Table, 2001). In

Jain, Priti

addition, e-mail and Internet facilities are very limited. The need for establishing a solid infrastructure for sustaining long term IT growth in Botswana from which information service providers can thrive is imperative.

Therefore, the development of IT industry in Botswana faces a great deal of challenges but there are efforts being made to enhance its developments through government, private sector and institutional training programmes. The lack of human resources, government support, proper telecommunication infrastructure, financial availability are hampering IT development in Botswana. In order to address these challenges and build on the strengths available, the government needs to promulgate an IT policy that would provide a conducive environment for private sector participation to enhance infrastructure and human resource development.

There is an urgent need for the government and the private sector in Botswana to spearhead IT development through partnerships in areas such as infrastructure development of human resources in IT, national IT policy; introduction of IT oriented curriculum in schools, introduction of IT awareness programmes, reduction of tariffs on computing facilities, improvement of telecommunication, software and network equipments.

OPPORTUNITIES

Efforts are being made to introduce computer education in schools. There are other private initiatives underway. For example, UNICEF has a project to establish information resource centers in schools and equip such centers with Internet connection. There is consultation towards the formulation of a national IT policy. A co-operative project known as the Experiment in Remote Printing (TPC) has two African countries amongst its 27 and Botswana is one of them (Jensen, 2002). Tracer studies have been carried out by the Department of Library and Information Studies (DLIS) to establish skills needed within Botswana. Such studies will enhance curriculum development in the training institutions and improve the quality of IT education. The government has made strides in creating a conducive environment for IT investments in the country through political and financial market stability as well as the deregulation of the telecommunication sector. There are taken to enhance private and public sector partnerships in promoting IT development in the country.

CONCLUSION

High caliber human resources who can exploit and use IT, a national IT policy, adequate IT exposure in schools, sufficient and reliable telecommunication infrastructure, and IT benefits awareness, are important factors influencing IT diffusion in any country. Those who aspire to be growth-oriented and sustain a

competitive edge in a global market in all spheres, be it social, economical or political, have to consider the above factors. There are a number of potential factors existing in Botswana, but conceptual awareness seems to be missing. A significant number of respondents identified a lack of IT benefits awareness as one of the constraints in IT diffusion. One respondent emphasised, "A critical mass of people do not know what they do not know". If there are strategies adopted to acquire IT in order to realise dividends on an investment, only then can IT be acquired, adapted and diffused to its optimum potential. Technology changes too fast and requires one to keep pace with it.

REFERENCES

- Akolo, J. 2001. Government advised to explore IT. *East African Standard*. February 12 : 12.
- Gaolathe, B. 2002. *Budget speech: Republic of Botswana, 11th Feb*. Gaborone: The Government Printer. Also available at : <http://www.gov.bw>
- Gibson, R. 1998. Informatics diffusion in South American developing economics. *Journal of Global Information Management*, Vol. 6, no. 2: 36. Also available at: <http://www.btc.bw>.
- Infrastructure Facilities*. 2001. Ministry of Information Technology, India. Also available at : [Wysiwyg://9/http://www.mit.gov.in/infra.htm](http://www.mit.gov.in/infra.htm)
- Jain, P. 2001. *An Analysis of Information Technology (IT) Diffusion in Botswana: A Study of Gaborone*. Unpublished report.
- Jensen, M. 2002. *The African Internet – A Status Report*. Also available at: <http://www.3.sn.apc.org/Africa/afstaat.htm>
- Botswana. Ministry of Finance and Development Planning. 1997. *NDP 8 1999-2003*, Gaborone, Government Printer.
- Nelson. M.R. 2001. *Technologies and Policies for Bridging Digital Divide. (Internet Technology and Strategy)*. Available at: MRN@US.IBM.com
- Network Wizards*. Available at : <http://www.nw.com>.
- Pule D. 2001. BPS spends P 10M on computerisation. *Midweek Sun*. August 8 : 11.
- Richards, J. 2001. ITV_ alternative media. *Botswana Guardian*. August 31 : 30
- Tlale, B. 2001. Number of teachers without computer skills is shocking. *The Botswana Gazette*. June 13: B4.