Motivation, influences, and perceived effect of ICT adoption in Botswana organizations

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Abstract

Purpose – The purpose of this paper is to examine the motivation, influences, and perceived effect of information and communication technology (ICT) adoption in Botswana organizations. While a conceptual model of the adoption process in developed countries has been studied, not much empirical studies have been undertaken. This paper is an attempt to bridge this gap. Specifically, the paper addresses five questions: What motivated organizations in Botswana in their decision to adopt ICT in their operations? What factors, internal and external, influenced the adoption decision? Which sources did the organizations contact for information on the adoption of ICT? What is the relative importance of those influencing/motivating factors and information sources? What are the perceived effects of adoption?

Design/methodology/approach – The study was carried out using a survey method. The main instrument is a personally administered questionnaire that was based on items obtained and adapted from literature. Data were collected from a judgment sample of 29 business and public sector establishments, drawn from nine towns and cities of Botswana. The respondent in each organization was either the IT manager or the chief executive. The initial stage of the adoption process is examined by identifying, in the sample Botswana organizations, the internal and external proponents of the ICT adoption process, the sources from which organizations seek technical information, their perceived relative importance in the process, and the effect of adoption on organizations' activities.

Findings – The study found that ICT application in Botswana was still at an elementary stage, mainly communications and recordkeeping. In terms of motivation and influence, the competitive motive and internal sources of information and influence were dominant and that the overall effect of ICT adoption on several organizational activities was moderately positive.

Originality/value – The identification of the key sources of influence and information for the adoption of ICT helps ICT marketing companies to target their marketing efforts more specifically, and services offered limited to basic needs that are relevant to the use to which ICT is currently applied in Botswana. Widespread adoption of ICT has turned it into a kind of "hygiene" factor rather than a "motivator". In spite of the positive effect adoption has on various activities of adopting organizations, adoption benefits are matched by similar benefits of competing organizations, thus conferring no competitive advantages. It is only in the absence of adoption that those organizations adopting enjoy such competitive advantage.

Keywords Communication technologies, Small- to medium-sized enterprises, Motivation (psychology), Botswana

Paper type Research paper

Introduction

The potential and inevitability of information and communication technologies (ICTs) application for growth, and development of countries, businesses, and leisure and

sports organizations, are now widely acknowledged (World Bank, 2006; Carbonara, 2005; Beech *et al.*, 2000; Charney and Leones, 1995; Crede and Manell, 1998). Such benefits are brought about by the capacity of ICTs to create new services, new sources of revenue, new markets, new employment opportunities, and increased productivity and cost effectiveness (Crede and Manell, 1998). ICT diffusion is changing the way in which organizations operate and/or compete. New ventures are being created while existing businesses are being modified (Carbonara, 2005). Although ICTs widespread adoption reduces the competitive advantage enjoyed by early adopters, non-adopters are however still disadvantaged by their inability to join the band wagon. As such, there are likely to be many "me-too" adopters, whose decisions to introduce ICT into their operations are motivated by just merely keeping up with the Joneses. Given the costs of ICT applications, such "me-too" adopters are likely to be more common in developing countries, particularly those with small domestic market, served largely by small- or medium-sized establishments.

Botswana's National Development Plan 9 (NDP 9) aims at promoting the country's economic growth and development (including human development) through economic diversification, employment creation, poverty reduction, continued macroeconomic stability, and financial discipline. In addition, Botswana's Vision 2016 envisions an educated, informed, innovative, prosperous, and compassionate nation (Botswana Government, 1998). The achievement of these objectives could be facilitated and sustained by the adoption of ICTs.

The Botswana government has recognized the critical role of ICT as an enabler in the quest to realize its socio-economic objectives and translate its vision into reality. In 2001, the Minister of Communications described ICT as the "world's most important facility in the 21st century" (Magang, 2001). The government expressed the hope that, by 2016, "Botswana will have entered the information age on an equal footing with other nations" [and] "[. . .] will have sought and acquired the best available information technology, and have become a regional leader in the production and dissemination of information." (Botswana Government, 1997 p. 5). The Government has developed a National ICT Policy (NICTP), which, in keeping with Vision 2016, envisions that "Botswana will be a globally competitive knowledge and information society where lasting improvement in social, economic and cultural development is achieved through effective use of ICT." (Botswana Government, 2004, p. 12). The three main objectives of the NICTP are to:

(1) create an enabling environment for the growth of an ICT industry in the country;

(2) provide universal service and access to information and communication facilities in the country; and

(3) make Botswana a regional ICT hub so as to make the country's ICT sector globally competitive (Botswana Government, 2004, p.10).

ICT growth in Botswana

ICT adoption in Botswana has grown consistently since the beginning of the last decade. The number of main telephone lines has increased from 59,673 in 1995 to 136,000 in mid-2004 and that of personal computers from 15,000 to 720,000 within the same period. The number of Internet users has recorded similarly impressive growth, from 1000 in 1995 to 22,000 in mid-2004. Uptake of the mobile phone in Botswana has

been a great success, and now far exceeds the capacity and reach of the fixed line. From virtually no subscribers in 1997, there were, in 2006, more than 367,000 subscribers, with one of the two local operators claiming its subscribers exchanged over 100,000 short messages daily (UNDP, 2005). The growth in ICT usage occurred in spite of several technical (systems compatibility, data security, etc.), business (netting the impact of ICT on returns on investment), and market forces (lack of providers, access, etc.) difficulties that adopters, particularly in developing countries, face (International Research Centre, 1995). In addition, there are considerable challenge areas such as lack of skilled workers, lack of call centre management expertise, and inadequate physical infrastructure. The critical need for continuous investment in infrastructure, education, and skills development to address these challenges is well recognized in the action plan set out in the NICTP (Botswana Government, 2004).

The government has embraced technology as an efficiency tool and has allocated P1.3bn (P6.2 = US $) for technology programmes in the NDP 9 period (Botswana Government, 2004). While there has been considerable investment in ICT in Botswana, the level of ICT penetration is still relatively low. In particular, for the most part, Botswana's private sector has still to embrace ICT. There are minimal levels of business to business and business to consumer e-commerce transactions and a very small (but developing) ICT sector. The World Bank (2006) estimated that only about 19 per cent of firms currently use the web in their interaction with clients/suppliers. However, some of the traditional, more sophisticated sectors of the economy, such as the mining industry and financial services sector, use far greater levels of electronic transactions, although they often complain of inadequate service quality constituting a barrier to further business opportunities.

Generally, the marketplace lags behind the National ICT goal of developing a globally competitive ICT sector. A vibrant private sector – where firms invest, create jobs, and improve their productivity – promotes growth and increases opportunities for poor people (World Bank, 2004). The government will have to play a leading role, through appropriate enabling policies and incentives, in helping the private sector to embrace IT in the interests of national objectives. A World Bank Report (2006) observed a growing consensus among the development community that governments should place a high level of priority on improving ICT access and quality in order to improve the investment climate in their countries. For the Botswana government to effectively provide such, it would require a baseline study of the ICT adoption process in Botswana organizations.

This paper attempts to investigate the motivation, influences, and perceived effect of the application of ICTs in organizations in Botswana. Specifically, the paper addresses five questions:

(1) What motivated organizations in Botswana in their decision to adopt ICT in their operations?

(2) What factors, internal and external, influenced the adoption decision?

(3) Which sources did the organizations contact for information on the adoption of ICT?

(4) What is the relative importance of those influencing/motivating factors and information sources?

(5) What are the perceived effects of adoption?

ICT adoption process

Various researchers have proposed that the adoption of ICT by small and medium scale enterprises (SMEs) follows an ordered sequence of stages, moving from basic use of the Internet to the full integration of business systems and redesign of business processes (Alonso and Fitzgerald, 2004). Rogers (1983) proposed a five-stage innovation-adoption model that Lefebvre and Lefebvre (1996) have applied to the ICT adoption process. The first stage of the ICT adoption process, described as the "intelligence or research stage" by Lefebvre and Lefebvre, is characterized by a "systematic scanning of information" in which "the availability of technical information from different sources, as well as knowledgeable and influential proponents (internal and external), plays a major role" (p. 29).

In the literature on innovation, it is often assumed that an innovation is either adopted or not adopted by individuals or organizations depending on their motivations and beneficial expectations. Several studies try to explain ICT adoption by the conventional factors, such as perceived benefits, organizational readiness, external pressures, changes in organizational strategy, structure, management systems and human capital skills, and openness to external sources of information (Mehrtens, Cragg, and Mills, 2001; Rogers, 1983; Spanos *et al.*, 2002). Southern and Tilley (2000) posit that there are both exogenous and endogenous factors influencing the adoption, implementation, and the successful management of ICTs. Beckinsale and Levy (2004) using network-actor theory identifies customers, suppliers, and competitors as sources of information and influence on ICT adoption. Internal influences include employees and management (Beekhuyzen *et al.*, 2005; Thong and Yap, 1995). Beekhuyzen *et al.* (2005) stressed the unique role of management commitment and perceptions of ICT benefits as an influence in SMEs ICT adoption. And Thong and Yap (1995) hold the view that SMEs that are likely to adopt new IT will usually have a CEO with a positive attitude, and who is innovative and knowledgeable about IT.

This paper examines the initial stage of the adoption process by identifying, in the sample organizations in Botswana, the internal and external proponents of the ICT adoption process, the sources from which organizations seek technical information, their perceived relative importance in the process, and the effect of adoption on organizations' activities.

Research method

The study was carried out using a survey method. Information was collected, through a personally administered questionnaire, from a judgment sample of 29 business and public sector establishments, drawn from nine towns and cities of Botswana. The respondent in each organization was either the IT manager or the chief executive. However, assistance was sought from other members of staff where either of these officers did not have the required information. Over 70 per cent of the sample companies were business establishments engaged in manufacturing, service, or marketing. The remaining establishments were government ministries or parastatal and one unspecified. Almost 60 per cent of the companies were established ten or more years ago, with full ownership by citizens, government, or foreigners accounting for 19 of the 29 sample firms. The remaining ten organizations were joint ventures between a combination of citizens, government or foreign investors.

Findings and discussions

The paper is divided into six sections. The first section describes the scope and type of ICTs in the sample companies while the second section identifies the sources of pressure for the adoption of ICTs and analyses the level of pressure exerted by each of the sources. As in any other purchase decision, the potential adopter seeks information (technical and economic) from both internal and external sources. These are analyzed in the third section, while the fourth section discusses the motivation and expectations of from adopting the technologies. The fifth section presents the opinion of respondents on the effect of ICT adoption on their organizations while the last section presents the conclusion of the study.

Computerization and type of ICT facilities

The use of ICT in the sample organizations has occurred steadily in the last 15 years, with almost equal numbers of organizations adopting the technologies in each of the five-year intervals. Table I presents the scope of ICT facilities used in the sample firms. Personal computers are available in all the 27 organizations that responded to the question on the types of ICT facilities available. Access to mainframe and minicomputers was rather insignificant as only three organizations invested in such facilities. Communications and exchange of information was the predominant usage to which the computers were put. Intranet and Internet facilities were available in 22 and 20 of the organizations, respectively. Other facilities available include laptop computers and PDA.

Apart from communications, a few organizations use computer for routine data storage and transaction processing. Table I also summarizes the range of ICT applications and facilities reported as being in use by respondent organizations. It shows that computer usage among the various organizations studied is at an elementary stage. This low level of ICT penetration reflects the similarly low level of sophistication of the economy, its market, and organizational business as well as that of the technological competencies, characteristics that seem to determine the level of ICT employed in industry.

Computerization experience	Number of organizations
Number of years of computer usage	
1–5	9
6–10	8
11–15	9
>15	1
Types of ICT facilities and usage	
Personal computers	27
Intranet	22
Internet	20
Productivity software	14
E-mail	13
Extranet	12
Application software	11
Database server	10
Laptop	10
Mainframe	2
Minicomputers	1
PDAs/palmtops	1

The sampled organizations being mostly SMEs, this finding agrees with the recent conclusion that the penetration, diffusion, and adoption of ICTs are still quite low among SMEs (Eurostat, 2002).

Source and level of pressure for ICT adoption

External sources appeared to be more important than internal in terms of the intensity of the pressure exerted. Competition, customers, and suppliers constituted the highest sources of pressure to computerize. The level of pressure from these sources was rated "high" by majority of the sampled organizations. Since computerization might affect the nature of raw materials and the quality and costs of products, its adoption is of interest and benefit to the consumers and suppliers. The awareness of computerization need can be stimulated internally (employees, labour union, etc.) or externally (customers, competitors, suppliers, or trade association). Each of these may exert different levels of influence or pressure on the organization to embrace ICT. Our organization respondents were asked to indicate the sources of pressure and the levels of such pressure in their decision to adopt ICT. Table II shows the cross tabulation of the responses.

The positive effect on cost efficiency and organizational profitability limits the extent to which organizations could ignore the general trends in business. As such ICT adoption by competitors is a major influence on other competing organizations. Employees exerted a high level of pressure in ten of the organizations. These were likely to be employees with a high level of competence in ICT. The influence of computer vendors, IT consultants, and trade associations was generally considered low. Similarly low was the influence of the labour union. Perhaps, the fear of possible job loss arising from new skills requirement or the labour-saving features of ICT make it unlikely for the generality of staff or their unions to press for ICT adoption.

A χ^2 statistical test was conducted to see whether the levels of influence or pressure exerted by various sources were significantly different. It was found that the differences in the distribution of the level of pressure exerted were highly significant at the 0.005 level. It could therefore be concluded that the pressure exerted by customers and suppliers was high while that by labour unions and trade associations was low. The pressure exerted by the other sources was perceived as moderate, with no significant differences in the numbers rating the level of pressure as low, moderate, or high.

After the organization has been introduced to the idea of adopting ICT, it begins to search for technical information on types, costs, and possible areas of application.

Source of pressure	Level of pressure exerted		
	Low	Moderate	High
Customer	6	3	17
Competition/business trend	3	5	15
Supplier	8	5	14
Trade association	19	3	3
Computer vendors	11	6	7
IT consultants	9	10	4
Government	9	4	10
Labour union	19	3	1
Staff	6	7	10

From which sources does the organization seek information? And what is the organization's perceived importance of those sources? Table III shows the sources from which information was sought, and the sampled respondents' perception, of the importance of each source.

Among the internal sources, human resources and marketing departments were not perceived as highly important sources of information for ICT adoption decision. On the other hand, accounting and finance, top management, IT department, and production were considered highly important sources of information. These differences in the perceived importance of the various internal sources were found to be statistically significant at the 0.05 level, suggesting that the differences in the perceived levels of importance of the various sources of information were real.

The perceived levels of importance of various internal sources of information seem to reflect the importance of costs and the role of the sources in the adoption decision. About 80 per cent of the organizations ranked accounting and finance and top management as highly important sources of information. Understandably, the views of these two sources may determine the final decision to adopt or not. Consequently, their opinion in the initial process has to be heavily weighted.

Three external sources were perceived as highly important for technical information. The parent/partner organization appeared to be perceived as the most important. This again underscores the importance of this source in the final adoption decision as well as reflects the subsidiary or dependent nature of many organizations in Botswana. Many organizations are either franchisees or subsidiaries of mainly South African establishments. During our fieldwork, we observed that many organizations reported to South African establishments or were using ICT systems developed by South African establishments and integrated into the South African

Source	Level of importance of source		
	Low	Moderate	High
Internal			
Marketing	7	1	8
Human resources	8	6	6
Accounting and finance	2	3	18
Production	1	2	10
IT department	3	4	12
Top management	2	2	17
External			
Parent/partner organization	6	2	13
IT suppliers	8	5	11
IT consultants	6	7	9
Customers	10	4	7
Bankers	9	4	5
Competitors	6	1	5
Trade association	12	2	5
Universities	8	2	7
Government agencies	11	4	6
Trade fair	11	6	3
Internet	6	5	12
Publications	7	4	8

parent system. It is therefore rational to seek information on ICT adoption from such parent/partner organizations and to attach high importance to the information from that source.

The other two sources considered highly important are the Internet and IT suppliers. The high importance attached to these two sources may again indicate the importance of costs consideration in the ICT adoption decision. While IT consultants are likely to charge for their services, the Internet and IT suppliers are free sources of information and were perceived as more important. The other external sources were perceived more as relatively low important sources.

The information organizations seek would relate to the technical feasibility of ICT as well as the possible impact of ICT adoption on organizational performance. The bottom line of an organization's performance is profitability, which is determined by interplay of several factors, such as cost efficiency, productivity, customer relationship, competitive position, and employee/labour relations. How important are these factors in the ICT adoption decision?

An examination of Table IV suggests that, in general, most of the factors were not considered to be of much importance in the decision on ICT adoption. For most factors, the modal level of importance was either "least important" or "not important". Competitive image, improved employee/labour relations, and reduction in wage bills were the few factors that were perceived as "highly" or "very" important by not less than 6 of the 29 organizations responding.

The conclusion one can draw from the figures in Table IV is that the list of factors may not be exhaustive and do not contain the factors which most organization regard as "highly" or "very" important. Alternatively, one can conclude that the decision to adopt ICT may be more of keeping up appearances with competitors. As was pointed out earlier, the competitive advantage of ICT adoption weakens as the innovation gets

	Frequencies of perceived level of factor importance				
Factor	Highly important	Very important	Fairly important	Least important	Not important
Increase return on investment	1	1	4	11	9
Improve image among competitors	7	2	6	6	6
Enhance consumer image of organization	3	1	7	8	7
Reduction of operational costs	1	1	6	8	9
Improvement of quality of customer services	1	0	3	11	10
Improvement of employee productivity	0	2	4	10	11
Reduction in wage bills	1	5	7	7	5
Increase profitability	0	3	3	12	6
Improved customer relations	2	3	4	11	7
Improved labour/employee relations	5	3	6	5	6
Improved recordkeeping	2	1	0	9	13
Gain competitive advantage	3	4	2	8	9
Flexibility/adaptability of organizational activities	2	2	7	8	7
Increase volume of output	1	4	0	15	6

widely adopted. Yet, failure to adopt could be disadvantageous, a form of the "hygiene" factor in McClelland motivation theory.

Perceived effect of ICT adoption

To obtain the possible effect of ICT adoption in the organizations, respondents were requested to indicate their level of agreement or disagreement to 39 Likert-type indicants. Factor analyzing the responses, we grouped the 39 variables into four new factors, using the factor loadings which ranged from an absolute value of 0.615 to 0.993.We described the four factors as: employee/customer satisfaction; management of organizational resources; organizational structure, information and costs, and labour relations and working conditions.

Employee/customer satisfaction

This factor has ten variables with the mean score on each item ranging from -0.11 to 1.4. All items had positive mean scores with the only exemption being the flexibility of employees working outside organization premises. With a variable mean score of 0.767, respondents perceived the adoption of ICT has, among others, improved employee remuneration, increased staff morale, improved customer service delivery performance, and reduced customer complaints on organizational service/products. Not surprisingly, however, unlike in the developed countries, ICT adoption has not led to the creation of a virtual office, whereby employees could choose to work outside the organizational physical premises.

Contrary to the fear often expressed that ICT adoption reduces employment opportunities, respondents disagreed (mean score -0.21) to the statement that adoption of ICT "reduced the number of employees in the organization".

Management of organizational resources

The perceived effect of ICT adoption on resources management was also positive; with the factor mean score of 0.87.Ten items also measured the organization resource management factor. The mean scores of each item ranged from 0.12 for "improved ability to identify training needs" to the high 1.44 for "improved efficiency of financial/accounting control". The individual item scores showed that respondents agreed to the statements that ICT adoption "improved the reliability of accounting and financial reports", "improved work flow", and "increased ability for timely product/services delivery" but did not increase labour turnover.

Organizational structure, information and costs

This hybrid factor measures the perceived impact of adoption on organizational structure, information and costs. As expected, ICT application improved records keeping as well as information security, confidentiality, and retrieval. It also necessitated organizational restructuring, and brought flexibility and adaptability in organizational activities. While ICT adoption was not seen as increasing employee redundancy, it was perceived as increasing the total wage bill of the organization as well as reducing the inventory of both finished goods and input materials. As such, respondents perceived ICT adoption as beneficial to the quality of information and cost control.

Labour relations and working conditions

The fourth factor mainly deals with issues such as remuneration of IT staff, working hours, accuracy of personnel records, and staff training needs. Surprisingly, ICT adoption was not perceived to have improved the remuneration of IT-skilled staff above that of other employees or to have reduced capital investment or improved industrial and labour relations. The factor loadings for these items were high but negative, all at above 782 in absolute value. But adoption was perceived to have increased the flexibility of staff working hours, even though as earlier indicated, such work would still be on the premises of the organization, as well as improved the accuracy of personnel records. The overall mean score of the factor was 0.57 while individual scores ranged from -0.21 to a high of 1.52.Overall, it could be concluded that ICT adoption exerted a positive effect on several factors as expected by the adopters even if the level of such positive impact was rather low, given that none of the factor mean score was above 1.

Conclusion and recommendations

Although ICT is being applied globally to a large range of activities, e.g. integrated manufacturing, and process control, their use in Botswana is still very limited and elementary, mainly for communication and information processing and storage. The limited application may be due not only to the problems of costs and inadequate infrastructural facilities, but also to the level of sophistication and size of the economy. The fixed cost nature of ICT may make it non-cost-effective for low-volume production as is likely to obtain in many developing countries.

The decision of most organizations to adopt ICT tend to come more from outside agencies such as customers, suppliers, and competition than from inside sources such as employees or their unions. Customers were considered the most important source of pressure to adopt ICT.

The perception of the relative importance of the sources of information appeared to reflect the authority of the source to commit the resources needed for the implementation of the resulting decision. As such, among the internal sources from which information was sought, accounting and finance departments, top management, and IT staff were ranked high as sources of information. On the other hand, marketing and human resources departments were ranked low in importance. The same inference could be drawn from the high importance attached to parent/partner companies as a source of information. Given the subsidiary status of many organizations in Botswana, their decisions are often subject to approval of their principals.

Finally, the motivation for adopting ICT application seems to be to maintain the status quo rather than to gain any competitive advantage. With the increasingly wide adoption of ICT by rival organizations, failure to adopt becomes disadvantageous in terms of the image of the organizational and its products or service.

Three implications arise from the conclusions in this study. First, the identification of the key sources of influence and information for the adoption of ICT helps ICT marketing companies to target their marketing efforts more specifically. The services offered could also be limited to basic needs that are relevant to the use to which ICT is currently applied in Botswana.

Second, since the major motivation of organizations is to keep up with the trend in the industry, testimonies, or word-of-mouth support of similar organizations acquire

greater importance as promotional tools than conventional advertisements or other promotional efforts. The importance of word-of-mouth promotion underlines the need for keeping current customers satisfied as such satisfied customers become important promotional partners.

Third, widespread adoption of ICT has turned it into a kind of "hygiene" factor rather than a "motivator". In spite of the positive effect adoption has on various activities of adopting organizations, adoption benefits are matched by similar benefits of competing organizations, thus conferring no competitive advantages. It is only in the absence of adoption that those organizations adopting enjoys such competitive advantage.

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