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Sheryl Thompson

Department of Management Science Lancaster University Management School

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Impact of Policy Initiatives on the Adoption of Internet Technologies by Jamaican SMEs – Some Initial Findings

Sheryl Thompson

Department of Management Science
Lancaster University Management School
Lancaster, LA1 4YX, UK
s.thompson4@lancaster.ac.uk

David Brown

Department of Management Science
Lancaster University Management School
Lancaster, LA1 4YX, UK
d.brown@lancaster.ac.uk

Nigel Lockett

Department of Management Science
Lancaster University Management School
Lancaster, LA1 4YX, UK
n.lockett@lancaster.ac.uk

ABSTRACT

The advent of the Internet and its subsequent proliferation into most aspect of society and commerce has propelled ICT to the forefront of innovation. Its ubiquitous nature and the varied business opportunities it presents are beneficial to all organizations irrespective of size or location. SMEs contribution to employment and GDP has motivated initiatives targeting these companies to facilitate their adoption of ICT. The interventions by institutions in developing countries are crucial to the success of technology transfer, and the strategic positioning of local organizations. This paper looks at policies in Jamaica and in particular the role of government and AID supported projects. It will highlight the objectives outlined in the national strategic plan for ICT and how these policies translate into initiatives that support the growth and use of ICT. Empirical data from a case will illustrate how participating in these initiatives has facilitated adoption of e-business by the firm.

Keywords

ICT, developing country, Internet, policy

INTRODUCTION

The use of Internet-based technologies can enable firms to create new products and services and add value to existing ones. The emergence of e-business, defined here as the use of Internet technologies to replace, enhance, improve, expand or reinvent business processes, their associated functions and activities, has led to innovative ways in which companies can reduce cost, provide improved services to their customers and build more efficient supply-chains. The Internet, as a ubiquitous communication infrastructure, has obviated the need for organizations to adopt and implement information and communication technology (ICT) according to pre-defined stages and large financial outlays. Therefore the apparent inertia among small and medium-sized enterprises (SMEs) with regards to the adoption of Internet technologies has propelled governments to develop policies and programmes that are geared towards encouraging small firms to engage in e-business. For developing countries the role of institutions such as governments and international agencies can directly impact the adoption process.

This paper, based on on-going research, seeks to address the particular experience of ICT adoption by SMEs in developing economies and within the context of AID related initiatives. AID refers to agreements between government and international agencies to provide assistance for development. The results presented are partial but nevertheless are indicative of the overall findings of the research, which is in its advanced stages. Figure 1 sets out the elements of the contextual framework for ICT adoption by SMEs highlighting the distinction between technology transfer (TT) via spontaneous diffusion and policy initiatives by government and AID projects in developing economies - in this case Jamaica. It illustrates the point that for SMEs in developing economies adoption can either take place independently or be directly assisted. The remainder of the paper is divided into five sections; (i) theory and interpretive framework, (ii) ICT environment in Jamaica, (iii) research strategy, (iv) case and discussion and (v) conclusion.

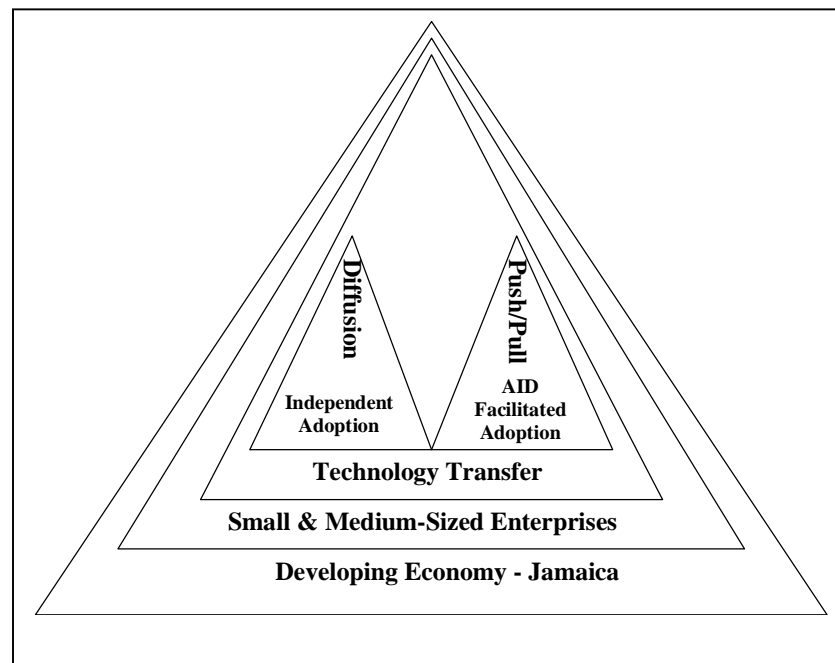


Figure 1. Contextual Framework

THEORY AND INTERPRETIVE FRAMEWORK

The IS literature sees technology transfer as a prevalent perspective that informs the adoption of IT worldwide. Technology transfer occurs either ‘naturally’ as purported by the diffusion of innovations theory (Rogers 1995), or it may be orchestrated by technology-push or need-pull situations facilitated by purposive policy, planning and implementation (Zmud 1984). International transfers require a complex chain of activities supported by efficient planning and management. Push-pull theory, often used to make sense of TT, is guided by the precept that the diffusion of an innovation will be encouraged either by the innovators continuously developing new and more advanced technology and persuading adopters; technology-push, or a where a need has emerged among potential adopters for a new technology; need-pull. In the technology-push arena, end-users opinions and needs are not important, this is different in the need-pull scenario, where it is the end-users who determine the pace and direction of innovations. Need-pull theory posits that the users’ needs are fundamental to the success of the innovation (Chau and Tam 2000).

The first stream of theory to be highlighted is related to the institutional intervention model. Government intervention and initiatives can provide an environment for TT to local organizations. By implementing national policies that allow local organizations to be competitive, investing in the proper infrastructure and defining efficient standards, an enabling environment can be created for the successful technical transfer of technology. According to Gilbert ‘creating a policy climate which nurtures international transfers of IT is particularly relevant to policymakers in developing nations’ (Gilbert 1992:404). Institutional intervention has been identified as one of the keys to the successful adoption of IT in developing countries (King, Gurbaxani, Kraemer, McFarlan et. al. 1994; Montealegre 1999). They postulate a model purporting that institutional intervention in IT innovation can be constructed at the intersection of the influence and regulatory powers of institutions and the ideologies of supply-push and demand-pull models of innovations. The model posits six kinds of actions; knowledge building, knowledge deployment, subsidy, mobilization, standard setting and innovation directives, that institutions can perform in an influential or regulatory role that can produce the “technology-push” or “need-pull” context for the actions to be effective.

Diffusion of innovations is the second stream of theory used to enquire into TT. “Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system”. (Rogers 1995:9) Rogers (1995) notes that attributes of an innovation namely relative advantage, compatibility, complexity, trialability and observability help to explain its rate of adoption. Diffusion theory posits that the rate of adoption will increase as each of these attributes increase; except for complexity, which is hypothesized to have the opposite effect. In other words the more

complex the innovation the slower the adoption rate. The diffusion process encourages TT naturally, as in the case of a multinational corporation that decides to implement uniform information systems in all of its offices in order to facilitate dissemination of information. The transfer of technology across national borders by organizations can also be undertaken from a strategic perspective, as the firm seeks to gain economic benefits and improve competitive position, or it can be initialized to decrease transaction cost. TT to developing countries therefore can occur, for example, as a result of foreign direct investments (FDI) from new or existing companies or investment in IT by local organizations. For example a global partnership that uses electronic data interchange (EDI). Under these circumstances the transfer of technology is not being guided or ‘pushed’ by government or national initiative, but happens as a consequence of business relationships.

The adoption of IT by SMEs is considered in this section. SMEs are usually laggards in the adoption of IT however the emergence of the Internet with sophisticated and high-speed telecommunications have presented a cheaper alternative for the sector to access network infrastructure; and therefore increased opportunities for businesses to become more competitive and profitable. Early studies predicted that SMEs were more likely to benefit from e-commerce in light of the fact that they are accustomed to operating in volatile external environments (Auger and Gallagher 1997; Gessin 1996; Nootboom 1994). In spite of these perceived advantages statistics published by the European Commission’s E-Business Report show that SMEs are reluctant to integrate e-business with their business processes (EC 2004). It is not a binary decision for organizations to adopt ICT; numerous factors are considered especially in the case of SMEs since there is often a lack of financial and human resources. Despite these limitations small businesses have advantages that are particular to their characteristics, decisions are executed and implemented rapidly and there is a capacity for adaptation and short-term reorientation (Julien and Lafrance, 1983). Thong (1999) found that IS characteristics such as relative advantage and compatibility play an important role in the decision to adopt. The individual characteristics of the CEOs such as their attitude to IT, innovation and their level of IT knowledge are potent determinants of adoption because they are the main decision-makers in the organization (Cragg and King, 1993; Thong, 1999; Thong and Yap, 1995). Constraints on financial resources and the lack of in-house IT expertise increase the level of risk that an investment in IT will represent to smaller companies (Blili, 1993; Dandridge, 1979; Fink, 1998). Perceived direct and indirect benefits have been highlighted by SMEs as one of the factors which determines their engagement of e-commerce (Grandon and Pearson 2003; Poon and Swatman 1999; Scupola 2004). The industry in which companies operate also impact e-business engagement; firms in the technology industry and those that require little or no interaction with customers are more likely to offer e-commerce (Drew 2003; Martin and Matlay 2001).

The Unified Theory of Acceptance and Use of Technology Model (UTAUT) and the Technology Acceptance Model (TAM) have measured users’ acceptance and use of IT. According to the unified theory diffusion will be faster if there is low complexity and effort expectancy associated with the use of the technology. TAM posits that two theoretical constructs: perceived usefulness and perceived ease of use are the primary determinants of computer acceptance behavior (Venkatesh, Morris, Davis and Davis 2003). The framework depicted in Figure 2 illustrates that these constructs as associated with the technology plays a key role in the attitude of the organization and the nature of the institutional intervention. These interactions will impact on the firm’s decision to engage in e-business and the extent to which Internet technology is utilized.

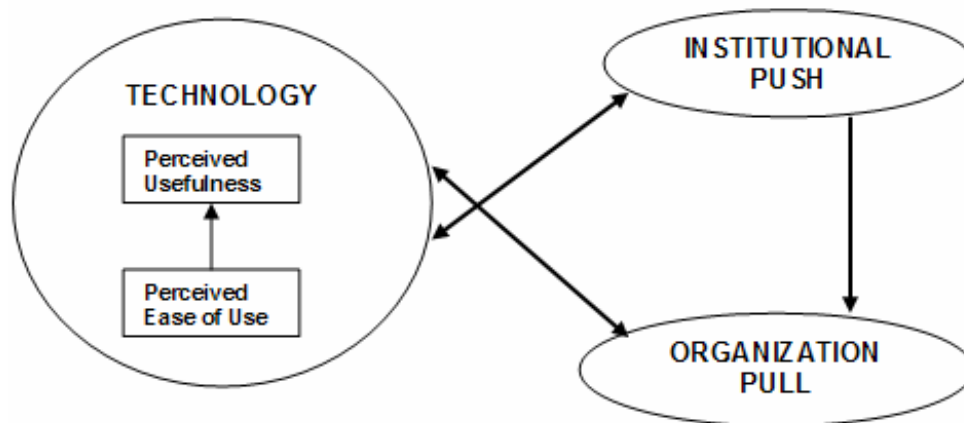


Figure 2. Interpretive Framework

ICT ENVIRONMENT IN JAMAICA

As a part of its strategy for achieving economic growth and creating employment, the Government of Jamaica (GOJ) has made the integration of IT into the Jamaican economy a high priority and a strategic imperative. The objectives of GOJ are to promote Jamaica as a Caribbean hub for IT activities and investment; with a language advantage and low labour costs, the aim is to promote Jamaica as a viable outsourcing destination to companies in the United States, Canada and Europe (GOJ 2002). In 2000 a national strategic plan for Information Technology was developed. The objectives of the plan includes: (i) creating a competitively priced Nationwide Public ICT Network, (ii) using ICT to provide efficient government services to the public, (iii) using the Internet to facilitate growth in International trade and (iv) promoting the development of e-business. Driven by this IT strategic plan GOJ has taken actions aimed at improving the country's telecommunications infrastructure, legislation and human resources.

Liberation of the telecommunications industry following major reforms in 2000 has resulted in increased competition for wireless and wired services. Licences have been granted to two companies to install undersea fibre-optic cables into the country supporting the government's move for an expansive deployment of broadband, which is seen as crucial to the successful implementation of e-business by companies. In keeping with the mandate of creating a lucrative investment environment for foreign companies, the Jamaican government has also taken steps to improve its legislative and regulatory framework by establishing agencies and passing legislations to support a digital economy.

GOJ sees government's use of technology as critical to the use of the Internet by both businesses and individuals; therefore their intention is to become a model user. E-government initiatives have been undertaken by GOJ to provide government to citizens (G2C) services. A US\$23 million ICT Project, jointly funded by GOJ and the Inter-American Development Bank (IDB) was launched in 2003 and scheduled for completion in 2010. The project's main objectives are to accelerate Jamaica's e-readiness and attain international standards of performance and efficiency in both the public and private sectors, while reducing the cost of services to customers, promoting convenient access and enhancing their quality of life. A policy environment that encourages growth in the ICT sector supports the initiatives.

In 2002 the government in a review of tax policy removed all duties and sales tax from computers and implemented some ICT Development incentives such as granting investors exemption from income and dividend taxes for up to fifteen years and import duties on machinery and equipment. These efforts have resulted in the Global Information Technology Report for 2004/05 ranking Jamaica 49th out of 104 countries in terms of networked readiness; the highest achieved by an English-speaking Caribbean country with the United States, Canada, Chile and Brazil from the Americas ranking higher. In its first appearance in the 2005 e-readiness rankings produced by the Economist the country was ranked 41 and according to the report Internet penetration has nearly tripled since the liberalization of the telecommunications sector in 2000. Processes and procedures to manage the selection of participating firms and the facilitation of the IT initiatives have supported these policy initiatives.

RESEARCH STRATEGY

The case study research strategy was used to undertake the task of exploring the adoption of Internet technologies by Jamaican SMEs. The empirical work was carried out in Jamaica during January – September 2005. An individual company defines a case for this research. Case companies were selected on the criteria that they had participated in a collaborative scheme funded by GOJ and an international agency. In-depth interviews were conducted with persons inclusive of case company personnel, government personnel, persons from executing agencies for the specific government/AID initiative and ICT service providers. Triangulation of data was achieved by conducting document analysis of the case company where possible, and using secondary sources of data including websites of the case companies, reports from the project executing agencies and news items. Relevant characteristics about the eight (8) cases examined in the wider study are summarized in Table 1 below and Case A, a typical of medium sized, established manufacturing companies in Jamaica that do not have a significant level of e-business engagement is discussed in the next section.

Particulars Cases	Core Business Activity	E-business Activities	Government/AID Initiative
Company A	Manufactures leather products	Email, POS, Website (soon to offer e-commerce)	Improve production efficiency by introducing new technology, establish brands and develop e-commerce website
Company B	Manages companies under the jurisdiction of the Company's Act	Email, Website, Intranet, E-commerce, Electronic Banking	Redesign website and add e-commerce capabilities
Company C	Provides loans to micro and small businesses	Email, Basic Website, Remote Access	Acquire and install computer systems
Company D	Manufactures aromatherapy products	Email, Website, POS, Remote Access, Electronic Banking, E-commerce	Redesign website, acquire computer software and facilitate participation in overseas trade shows
Company E	Provides brokerage service for importers	Email, Website, Remote Access, E-commerce, EDI (via the Internet)	Training for the use of new Internet portal used by importers and exporters
Company F	Manufactures sauces and seasoning	Email, Website, Intranet, VPN, VOIP, E-commerce	Updating of website and promotion of products
Company G	Provides data processing services	Email, Website, FTP	Website development and facilitated trade show attendance
Company H	Researches technology that can be used by various industries	Email, Website, E-commerce	Website development, marketing and development

Table 1. Summary of Cases used in Research

CASE AND DISCUSSION

The case presented and discussed in this section participated in a scheme funded jointly by GOJ and the European Union (EU). The initiative dubbed the Trade Development Project (TDP) was a four-year technical assistance project that was geared specifically toward private sector export companies. Its main objectives were to increase the international competitiveness of Jamaican companies and create sustainable trade and product growth. Participants in the scheme funded 50% of all activities and TDP funded the other 50%. Case A is a 23-year-old manufacturing company whose core business is to make leather products. The company, which employs 120 persons, is the largest local manufacturer of leather products and wholesales and retails its own goods. In the 1990s the company became unprofitable suffering the effects of internal and external environmental factors. The external factors that affected the company adversely included further deregulation of the economy, which resulted in the removal of trade barriers thereby allowing large volumes of imported footwear that were being sold cheaply. Internally, the company suffered from inconsistencies with the quality of its products, the under-utilization of its plant and equipment and also inability to meet delivery deadlines to its customers. They also suffered from a lack of market awareness since their brands were not established and their products were relatively unknown.

In 2001 Case A became aware of TDP and despite never having participated in any such initiative before, the CEO decided to apply for assistance from the project; this decision was aided by the fact that the company had been making a loss for a few years and was cash strapped. The financial impediment was preventing the company from re-engineering its production process and creating awareness for its products. A manager of the company stated "when we started on the TDP project we had a clear idea of what we wanted to achieve but our problem was how we are going to get there and that is where TDP came in. We had some ideas of what we wanted to do but in order to get there we needed expertise to chart a course and financial assistance to get there". Under TDP the company benefited to the amount of just over US\$120,000. The funds were used for production research, design, development testing and approval, production efficiency, cost reduction, quality management, market research and development, advertising, promotion materials and the development of a new website. For

2003 Case A had increased income, arising significant sales growth, from US\$1,240,000 to US\$2,040,000 resulting in the first profit showing in years.

Theme A: Technology

With regards to the Internet the level of complexity in its use ranges from quite low, as in the case where it is used for communication purposes such as email to high when used for collaborative purposes such as CRM. The perceived usefulness and the perceived ease of use that is associated with the Internet will encourage organizations to adopt the technology. Perceived ease of use is the effortlessness that is connected with the use of the Internet, while perceived usefulness is the ability of the technology to improve performance of activities. The ease with which the Internet could be added to their IT environment was what drove its initial adoption by Case A. Perceived usefulness however was low so there were no clear goals and objectives about how the use of the Internet would benefit the organization and this is evidenced by its narrow use in a company that had an established IT department supported by a fairly good infrastructure consisting of a LAN and various computer applications that automated their accounting and inventory functions. The decision to adopt Internet technology was instigated by firm based on the belief that it supports their business strategy and also the ease with which the technology could be incorporated within their existing structure. Low complexity associated any technology indicates to adopters that low levels of expertise and specialization are required and this will encourage its use. This is important to SMEs because of resource limitations, although it has been found that the use of third parties is essential to SMEs engagement in e-business (Brown and Lockett 2004). For Case A, initial adoption of the Internet involved using email and creation of a website; a process facilitated by external consultants.

Theme B: Institutional Intervention

The institutional intervention model developed by King et al. (1994) posits that institutions can influence the push of a technology by deploying knowledge, providing subsidies and setting standards. Under the TDP scheme Case A was given technical assistance provided by local and overseas consultants in the areas of product development and technology use. The consultants' assistance helped to make the production process more efficient and resulted in an increase in production output. Prior to re-engineering, output for the company was approximately 2,000 pairs of shoes per month, since their involvement with the project and as a result of the consultancy received, their output has been increased to 4,000 pairs per month when external factors such as load shedding and power cuts occur, and 6,000 pairs without the interference of these extenuating factors. The expanded use of the Internet and the development of a website created some awareness for the company, giving them a better image and helping with their re-branding strategy. This has resulted in the local market being "expanded tremendously" with the products selling much better than before because of improvement in product and quality. Subsidies as a result of tax reform by the government were not unique to the company; however Case A benefited from additional subsidies because it is a manufacturing company. In financial terms though the funding received from TDP was crucial to the company' further adoption of Internet technologies and their ability to offer e-commerce. In fact the completion of TDP has resulted in the launch of the e-commerce website being postponed because there are insufficient funds for the company to go ahead as scheduled. However this will not see them abandoning their decision for further integration of Internet technologies, as they will seek to participate in another initiative that will be a successor to TDP. In the case of this company, institutional intervention clearly played an important role in their adoption and implementation of Internet technologies. At its initial adoption of the Internet the company had a dial-up connection with no widespread use of email being evident and access restricted to the CEO and IT Manager. However after their participation in the TDP initiative their connection was upgraded to broadband via ADSL, access is more distributed through the use of a proxy server and email is used on a wider scale and has become their primary means for communication internally and externally. The website is used for marketing their products and creating exposure for the company in overseas market, several new partnerships have been forged as a result of their presence in cyberspace.

Theme C: Organizational Context

Characteristics of the organization such as organizational readiness, awareness of the CEO, strategic intent and perceived benefits are all internal factors that can influence the adoption of ICT. SMEs with CEOs whose disposition towards IS are positive are more likely to adopt since their perception of ICT is that it is beneficial, once it is compatible and comparatively easy to use. CEOs who perceive that e-commerce will add strategic value to their organizations and who believes that there are long-term indirect benefits to be received from e-commerce are more positive towards adoption. As far as Case A is concerned the decision to offer e-commerce was a team decision and didn't come from one person. It wasn't a strategic decision to utilize Internet technologies, it came as part and parcel of achieving the other objectives of re-branding and changing the company. The Manager stated "it wasn't that we decided that we need to have e-business as the driving force.

We saw it as a part of what we were trying to do. It wasn't seen as the thing to turn the company around; it was seen as a part of the turning around process". One of the main benefits that the company acknowledges from the use of the Internet is that it makes communication a lot easier, faster and cheaper. This has been important to the firm because they have business partners in a number of countries regionally and the use of email has been very profitable. The intention of the company is to offer B2C e-commerce as soon as possible, according to the Business Development Manager "there are a lot of perceived benefits from this because it would be a lot easier and faster than the process that we currently use, this will provide greater efficiency in processing of orders and supplying of orders. We intend to get to the point where everything is electronic, that is, the order form is available online and filled out electronically and submitted. We thought about partially implemented this system on the website, at least to the point of accepting orders online but decided to wait so we can go fully e-commerce".

CONCLUSION

The early results presented in this paper are indicative of the findings emerging from the detailed cases. Case A had the perception that having a website would play an important role in creating awareness of the company but the realized benefit of more efficient communication had not been perceived. Likewise, perceived usefulness of the Internet for developing brand awareness and knowledge about their products locally and regionally was evident within the company but financial and technical constraints meant that the likelihood of IT being prioritized was very low. Participating in the scheme proved to be the major turning point in the use of technology by the company. The benefits attained, not all of which could have been anticipated, have convinced the managers of Case A to continue to innovate their processes through the extension of ICT technologies. In this, and the other cases, the technology and organizational characteristics are enabling factors in the decision to adopt ICT but are not sufficient to guarantee adoption. In the developing economy of Jamaica this research demonstrates the importance and effectiveness of technology transfer policies in persuading SMEs to adopt the new technologies. For the latter to occur, however, the research also demonstrates that policies need to be transformed in to funded initiatives, and that these initiatives require an 'intervention process' that engages and supports the firm in the adoption and implementation.

Generalizing the above in a policy context a liberal telecommunication sector supported by national policies for ICT is crucial for the rapid adoption of Internet technologies by SMEs. As acknowledged by the World Bank: "bilateral and multilateral assistance will continue to play a significant role in the building framework conditions for IT development. International financial institutions are well placed to contribute..." (World Bank 2001:2). However this policy and program intent is unlikely to be enough. Governments and donor agencies may have to push the adoption by being change agents and instituting managed interventions – the intervention process - from which these companies benefit. GOJ is a positive example: having made a commitment to provide appropriate infrastructure for ICT growth it has taken steps to harness AID projects effectively through a managed intervention process. Policy itself is insufficient: 'the successful adoption of Internet technologies in part depends on how these are used in conjunction with other technologies and management practices that form a technology cluster' (Windrum and de Berranger 2002:18). The authors found in their case study of a firm in the United Kingdom that network externalities affect the adoption of Internet technologies, and that the strategic approach of the organization is important.

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