Information Technology Interventions for Growth and Competitiveness in Micro-Enterprises

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ABSTRACT

150 words or less

Keywords: competitive advantage; focus-dominance model; information systems; micro-enterprises; small businesses

INTRODUCTION

There is evidence to suggest that use of Information and Communications Technology (ICT) can play an important role on the growth of small businesses (Matthews 2007, Sullivan 1985, Qiang et al 2006, Raymond et al 2005). In this sense, IT can be employed to bring about increased competitiveness if it enables businesses to create new jobs, increase productivity and sales through access to new markets and administrative efficiencies (Qureshi 2005, Mat-
These outcomes can be achieved through measurable improvements in the lives of people living with limited resources to sustain themselves. Duncombe and Heeks (2003) suggest that there is a role for the ICT intermediary in providing the needed information on markets, customers and suppliers. In their study of 1000 small business enterprises in the US, Riemenschneider et al (2003) found that businesses were prepared to overcome obstacles to IT adoption to achieve web presence. This is because pressures to keep with the competition and promote services to customers are greater than the obstacles to setting up websites. There is a sense that small and medium enterprises hold the promise of growing incrementally on existing capabilities, and providing a seedbed for the emergence of dynamic and efficient larger national firms (Levy 2001, Mathews 2007, Servon and Doshna 2000).

It also appears that the promise of eBusiness adoption by micro-enterprises can potentially provide these businesses with the ability to access new markets and reduce costs through administrative efficiencies (Brown and Lockett 2004, Pateli and Giaglis 2004). However, the use of ICT by Small and medium Sized Enterprises (SMEs) remains a challenge in both developed as well as developing countries (Schreiner and Woller 2003, Sanders 2002, Lichtenstein and Lyons 2001, Hyman and Dearden 1998, Honig 1998, Piscitello and Sgobbi 2004). In particular, the opportunities opened up by the internet are limited in SMEs especially due to the challenges faced by globalization (Piscitello and Sgobbi 2004). Small and medium sized businesses are seen to be organizations that employ less than 500 people and typically have problems adopting IT due to competitive pressures and underestimation of time taken to implement IT (Riemenschneider et al 2003). A form of small business being investigated in this paper is the micro-enterprise. Micro-enterprises are tiny businesses with fewer than 10 employees - often just one. The micro-enterprises studied in this paper are part of a Micro-enterprise development program. Such programs make loans and or provide classes to poor people to help them start or strengthen their businesses (Schreiner and Woller 2003).

The challenges faced by micro-enterprises make it even more difficult for them to adopt ICTs for competitiveness. In particular, Piscitello and Sgobbi (2004) suggest that the key barrier to the adoption of ICTs is not size but the learning processes followed by the firms and access to networks of similar internet enabled business services. While a great deal has been written about the challenges faced by micro-enterprise adoption of ICTs, little has been done to provide business models that enable micro-enterprises to use ICTs competitively. According to Grosh and Somolekae (1996), barriers to growth of micro-enterprises are access to capital, educational level of the entrepreneur, legal barriers and start-up financing. In their study of information systems for rural micro-enterprise in Botswana, Duncombe and Heeks (2003) suggest that the role of ICT in enabling information and knowledge is important for both social and economic development. They found that there was a reliance on localized, informal social networks for their information for rural micro-enterprise. Information from these networks was of poor quality and not readily available; it appeared to fail the poorest and most disadvantaged entrepreneurs. In this sense, ICTs can represent an unaffordable addition to costs and the benefits of using them are not always apparent (Duncombe and Heeks 2003, Matthews 2007, Southwood 2004).

This paper investigates how micro-enterprises can adopt ICTs to grow and achieve competitiveness. The question investigated in this paper is: How can micro-enterprises adopt ICTs to achieve competitiveness? In order to answer this question, this paper investigates a set of seven micro-enterprises in the underserved communities of Omaha, Nebraska. The micro-enterprises had received hardware and software through a grant from the eBay Foundation administered by a micro-enterprise development program called the New Community Development Corporation. Through a series of action research steps carried out by the researchers, the ICT challenges faced by the micro-enterprises...
were diagnosed and treated with interventions through a process of “Information Technology (IT) Therapy” (Wolcott et al., 2007; Qureshi et al., 2008). This process involved providing individualized IT solutions to pressing problems and opportunities and the development of a longer-term IT project plan, customized for each of the businesses. In addition to the IT therapy process, the researchers were able to analyze the potential use of the awarded technology to help achieve operational efficiency and competitive advantage. This was done by mapping each of the micro-enterprises’ current IT use combined with increase in IT awareness (on the part of the micro-entrepreneur) and transferred IT skills (to the micro-entrepreneur) – both as a result of the IT therapy process - to a theoretical model.

THEORETICAL BACKGROUND

Small Businesses and Information Technology

Past studies have shown that the use of ICT can play an important role on the growth of small businesses (Matthews 2007, Sullivan 1985, Qiang et al 2006, Raymond et al 2005). Cragg and King (1993) have shown that there is a gradual increase in the number of small firms that either adopt various new technologies or take steps to upgrade what they currently possess. The studies suggest that IT can be employed to bring about increased competitiveness if it enables businesses to create new jobs, increase productivity and sales through access to new markets and administrative efficiencies (Qureshi 2005, Matthews 2007). Small and medium sized businesses that have adopted and used ICTs have seen positive outcomes related to operational efficiencies, increased revenues, and are able to better position themselves within their market niche. Qiang et al. (2006) observed that businesses that utilized e-mail to communicate with their customers experienced sales growth 3.4 per cent greater than those which did not. Similar outcomes were also observed for productivity and reinvestment. Both these components were found to be greater for more intensive users of IT (Qiang et al., 2006). Other research in this area also highlights the positive impact of IT use within small businesses. A 4% increase in sales as well as 5% increase in export performance was obtained when e-business techniques were adopted by SMEs in the manufacturing sector in Canada (Raymond et al., 2005). Specifically, Raymond et al. (2005) mention that by using technologies such as websites, email and telephones to communicate with customers, SMEs can provide better customer service as well as expand their customer base to help reach out to both local as well as international consumers for their products. In another study Southwood (2004) found that ICT investments by SMEs in South Africa resulted in profitability gains from cost savings rather than from increase in sales.

In addition, studies have established that Information Systems play a significant role in small firms (Harrison et al. 1997, Igbaria et al. 1997). In particular, Street and Meister (2004) conducted a study that showed that improved internal transparency is a key component for small business development. The study concluded that Information Systems play a major role in enhancing communication and that the need for an appropriate IS occurs at a very early stage, even before many of the other structural or organizational changes are required. There also exist a number of studies that take the focus away from the direct impacts of IT in small businesses and instead look into various other angles of IT adoption and use in such types of businesses: Raymond (1988) studied the effect of computer training on attitudes and usage behavior; Montazemi (1988) investigated the relationship between computing issues and satisfaction of end-users; DeLone (1988) examined the link between CEO involvement and computer use effectiveness. While developing upon current research, this paper focuses on the adoption of ICTs by micro-enterprises to achieve competitiveness.

Although current literature supporting adoption of technology by small businesses
exists, in practice, this is not the scenario – particularly in the case of micro enterprises. In a study of a set of micro enterprises in North Omaha, many entrepreneurs who had received state-of-the-art technology to assist them with their businesses had not even opened the packaging within which these technologies were contained six months after they had received them (Wolcott et al. 2007)! In another study by Qiang et al (2006), among the micro firms, only 27 percent use e-mail and 22 percent use Web sites to interact with clients and suppliers. The study suggests that if computer use affects firm productivity and ICT expands networking within sectors and industries, the micro firms may not be benefiting from these externalities – benefits from ICTs. In addition, Bharati and Chaudhury (2006) surveyed micro, small and medium manufacturing firms within the Boston metropolitan area and found that most of the micro firms were using simple technologies such as basic e-mail, and simple software packages as compared to more complex technologies that were being used by the medium sized firms. Their survey results showed that the micro firms were not aware of most technologies that could be used for improving their business performance.

Challenges Facing Small Businesses

In order for micro-enterprises to benefit from ICTs and reach a level where they may be competitive, they need to overcome some of the barriers that are holding them back. Relevant literature in this area has identified a number of different challenges facing these small businesses.

• Affordability (Mansell & When, 1998; Hazan, 2002): This is a major issue with small businesses as they operate on very restricted budgets and do not have sufficient capital to invest towards state-of-the-art technologies.
• Awareness about IT (Owen & Darkwa, 1999): Most micro-entrepreneurs do not possess any technical skills and are oblivious to the capabilities that ICT has to offer. As a result, their ignorance on the power of IT may inhibit small businesses from growing and flourishing.
• Infrastructure (Baark & Heeks, 1998; Latchem & Walker, 2001; O’Farrell, Norrish, & Scott, 1999; Barton & Bear, 1999): A core requirements for any form of ICT implementation is to have a basic infrastructure in place that will support the new form of technology that is being introduced into that environment. Lack of such infrastructure will be a major barrier to the adoption and use of ICT.
• Private/Government sectors (Lefebvre and Lefebvre, 1996): These two agencies in any community play an important role in either facilitating or inhibiting the development of IT infrastructures to promote increased ICT adoption and use.
• Management’s capacity (Lefebvre and Lefebvre, 1996): Management’s capacity to incorporate IT into small business environments are also a crucial aspect in successful IT adoption and use; and lack of such capacity could become a major hindrance.

In other studies by Duncombe & Heeks (2002) as well as Moyi (2003), obstacles faced by rural micro-enterprises were highlighted. The challenges related to issues of remote locations, lack of education and literacy on the part of the business owner, poor business skills, poverty and lack of affordability, and lack of transportation.

Information Technology and Competitiveness

Despite these limitations, the competitive advantages of using ICT by the micro-enterprises outweigh the challenges. The relationship between IT and competitive advantage was first researched by McFarlan and McKenney (1983) who came up with a grid to place organizations based on the strategic impact of existing IT ap-
lications and the strategic impact of current IT applications development within the firm. The grid was helpful to the extent that management could utilize it to consider the right alternatives to pursue for improved competitiveness. Information technology can add economic value to an organization through 1) the reduction in the costs incurred by the organization, and 2) by differentiating the organization’s products or services (Bakos and Treacy, 1986; McFarlan, 1984; Wiseman, 1988). Taking this notion that IT can add value to a firm, Porter and Millar (1985) moves the discussion further by analyzing how advances in information technology have changed the way organizations conduct business and how it may serve to provide a competitive advantage. They explain three core ways in which IT may impact competitiveness: 1. by changing the industry structure, 2. by supporting cost and differentiation strategies, and 3. by creating opportunities to generate new businesses from within existing businesses.

Ives and Learmonth (1984) narrow down the focus of a firm to emphasize customer relationships, and they show how information system technology can enhance relationships with the company’s customers. They outline a 13-step customer resource lifecycle highlighting potential uses of IT at the various stages to enable competitive advantage for the firm providing the product or service to the customer (Ives and Learmonth, 1984).

Sethi and King (1994) have attempted to measure the extent to which IT applications may provide competitive advantage. They referred to the construct measuring this notion as “CAPITA” (competitive advantage provided by an information technology application) and operationalized it through five main dimensions – efficiency (degree to which an IT application enables a company to produce lower priced products than competing products), functionality (degree to which an IT application provides users with the functionality they desire), threat (impact of the IT application on the bargaining power of customers and suppliers), preemptiveness (early and successful penetration of the IT application into the market), and synergy (the degree to which the IT application is tightly integrated with the business goals, and strategies of the organization). In summarizing the early notions of how IT may impact an organization’s competitive advantage, see four distinct strategies emerge: 1) Low-cost leadership – using information systems and technology to produce products and services at a lower price than competitors while enhancing quality and level of service; 2) Product differentiation – using information systems and technology to differentiate products, and enable new services and products; 3) Focus on market niche – using information systems and technology to enable a focused strategy on a single market niche; and 4) Customer and supplier intimacy – using information systems to develop strong ties and loyalty with customers and suppliers.

Due to rapid changes in markets, customer expectations, as well as technologies and most importantly globalization, has made competitive advantages short lived. Along those lines, Mata, Fuerst, and Barney (1995) talk about how IT may provide not only competitive advantage but also sustained competitive advantage using a resource-based analysis. They emphasize that the “create-capture-keep” paradigm (Clemons and Kimbrough, 1986; Clemons and Row, 1987, 1991b; Feeny and Ives, 1990) whereby customers make certain investments (switching costs) specific to a particular supplier of IT, enabling those suppliers of IT to achieve competitive advantage does not truly hold when it comes to the sustainability of the competitive advantage. Instead, Mata et al (1995) takes the resource-based view of the firm (Clemons, 1991; Barney, 1991; Conner, 1991). In the resource-based view of the firm, resources and capabilities may provide a unique set of competencies that may serve to address either cost reduction or product differentiation strategies to eventually create value for the organization. This is summarized in figure 1.

Using the resource-based perspective, Mata et al (1995) put forward two major notions to explain sustained competitive advantage. The first concept is that of resource heterogeneity which states that competing firms may vary in
their resources and capabilities. The second concept is that of resource immobility which says that the differences in resources and capabilities between competing firms may be long lasting. Their argument is that if a firm’s IT resources are distributed heterogeneously among competing firms and if the firms without the resources find it more costly to develop, acquire and implement the same strategy as the firms that already have the resources, then those resources can serve to be a source of sustained competitive advantage. Mata et al (1995) develop a framework using the concepts of resource heterogeneity and resource immobility to depict how these two notions relate to competitive advantage. They then apply this model to four characteristics of IT – access to capital (McFarlan, 1984), proprietary technology, technical IT skills (Copeland and McKenney, 1988), and managerial IT skills (Capon and Glazer, 1987) – that prior literature has suggested to be sources of sustained competitive advantage. Their findings imply that organizing and managing IT within a firm, or in other words, managerial IT skills are the only source of sustained IT competitive advantage and that less focus should be made on the information technology itself.

In order to be able to achieve competitive advantage through its adoption of ICTs, what should a micro-enterprise facing multiple challenges do? Prior research has shown that there are two distinct routes by which small businesses incorporate ICTs. One route is to enhance day-to-day operational support and transaction processing activities (Blili and Raymond, 1993; Foong, 1999; Levy and Powell, 1998; Poon and Swatman, 1999). These studies have shown that small businesses adopt and use simple ICTs without any form of planned strategy to integrate other aspects of the business. And so any form of IT-based competitive advantage is accidental rather than planned (Hashmi and Cuddy, 1990). The second route that is typically taken is to use ICTs to improve interaction and relationships with customers. SMEs, and in particular micro-enterprises are strongly influenced by customer needs. Porter (1980) states, that in many small businesses, customer power is very high. It has been seen that a majority of SMEs depend on a small number of customers who purchase large amounts of goods and services. These major customers are then in a position to influence the price of goods and services that are being produced by the small businesses (Reid and Jacobsen, 1988). Close relationships among SMEs and their customers enable these businesses to respond quickly to customers’ changed requirements. Lefebvre and Lefebvre (1993) have shown that there is a link between the innovative efforts of an SME and its competitive position.
Levy et al. (2001) formulated an analytical framework (focus-dominance model), that incorporates both forms of strategic focus - the issue of cost reduction versus value added and the second one being customer dominance i.e. few versus many customers - that emerged from prior research described above. The model examines the potential for SMEs to realize value from IS capabilities. The framework shows where SMEs would fit in terms of the trend they show in IT investments and market strategies. The model is shown below in figure 1. The framework may be viewed as providing four different approaches to ICT adoption as a result of integrating the two dimensions of strategic focus. The efficiency quadrant may comprise SMEs that exploit simple systems such as word processing and trivial accounting processes (Naylor and Williams, 1994). The co-ordination quadrant is composed of those SMEs that have a need to increase market share and their customer base. The collaboration segment then attracts SMEs that attempt to incorporate emerging technologies to manage relationships with the businesses' major customers. And finally the innovation quadrant comprises of those SMEs that actively seek to adopt new information and communication technologies to help achieve competitive advantage. In a follow-up study, Levy et al. (2002) investigated 43 SMEs to observe their positions in the focus-dominance model. The results revealed that most of the 43 SMEs make only one move, from efficiency to co-ordination, or from efficiency to collaboration. SMEs taking either one these routes tend to avoid losing control and so opt to stay within their current markets. It was also seen that only 17 of the 43 SMEs wanted to move to the innovation quadrant possibly due to an environment scan whereby they become aware of “best practices” and strategies that would assist them to manage business growth.

This focus-dominance model was chosen to investigate how micro-enterprises can adopt ICTs to achieve competitiveness. This model is seen to be a valuable means for the analysis of each of the micro-enterprises in the study because it enables us to: 1) Identify the strategic position of each micro-enterprise at the time the study was conducted; 2) Predict the strategic position the micro-enterprise will be in a few years based on the context-specific business goals of each micro-enterprise; 3) Identify the information systems that will support the micro-enterprise in its current strategic position and 4) Map what information systems will be needed to support the micro-enterprise in its projected strategic position.

Moreover, the four quadrants of the focus-dominance model is an outcome of the true conditions encountered by SMEs highlighted through prior research. The unique contribution of the research taken up by the authors of this paper is to apply this model to the context of micro-enterprises (as noted earlier, these are the smallest form of businesses) – which has not yet been studied in the realm of this or any other theoretical model. The results will show that micro-enterprises do indeed fall into distinct categories and we provide support for our results.

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**Figure 2 The focus-dominance model (Source: Levy et al., 2001)**

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<thead>
<tr>
<th>Customer Dominance</th>
<th>Low</th>
<th>Co-ordination</th>
<th>Innovation</th>
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<tr>
<td>High</td>
<td>Efficiency</td>
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<th>Cost</th>
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by using the established notion of resource-based view of the firm to illustrate competitive advantage (Clemons, 1991; Barney, 1991; Conner, 1991; Mata et al., 1995). Our analysis reveals that through the micro-enterprises’ current IT resources – combined with capabilities provided through the IT therapy process, produce unique competencies to position these small businesses to be competitive.

**METHODOLOGY**

In order to investigate how the micro-enterprises can use ICTs to increase their competitiveness, an interpretive field study was carried out. According to Klein and Myers (1999), Information Systems research can be classified as interpretive if it is assumed that our knowledge of reality is gained only through social constructions. Interpretive methods in IS are aimed at producing an understanding of the context of the information system and the process by which the information system influences and is influenced by the context (Walsham 1993). This research follows an interpretive field study approach in which seven case studies are carried out. These case studies are carried out using Klein and Myers (1999) principles of the hermeneutic circle, contextualization, interaction between researchers and subjects, abstraction and generalization, dialogical reasoning, the principle of multiple interpretations, and the principle of suspicion. Within each case study, the data was collected and analyzed in iterative cycles of action research. Action research involves the application of tools and methods from the social and behavioral sciences to practical problems with the intention both of improving the practice and of contributing to theory and knowledge in the area studied. Action researchers participate directly or intervene in a situation or phenomenon in order to apply a theory and evaluate the value and usefulness of that theory (Checkland, 1981, 1991; Galliers, 1991). This conforms to Klein and Myers (1999) third principle which requires that there is critical reflection on how the data are socially constructed through interaction between researchers and participants. Action research is a change oriented research methodology that seeks to introduce changes with positive social values, the key focus being on a problem and its solution (Elden and Chisholm 1993). Action research is typically carried out as part of an attempt to solve problems by allowing the researcher to become a participant in the action, the process of change itself becoming the subject of research (Checkland 1981).

**Research Setting**

This study investigated seven micro-enterprises undergoing change through the adoption of ICTs for competitiveness. Each business has been given an arbitrary name for the purpose of this study and to maintain confidentiality of the businesses. All of the businesses are located in Omaha, Nebraska. Following are brief descriptions of each of the micro-enterprises studied:

1. LD specializes in high quality soups and sandwiches. During the period of this study LD moved its deli from its original location to a better one that could serve local businesses and students.
2. FD specializes in the design of elegant, conservative women’s clothing. The owner has aspirations of being a player in the global fashion market.
3. CZ is a franchise that pairs individuals of all ages who need tutoring in any subject with tutors who can provide the service.
4. HH offers a structured residence with treatment and support services to individuals who are transitioning from a treatment program back to society.
5. HE offers massage therapy services. The owner is seeking to diversify into the retail sale of a variety of natural health products.
6. EP is a modeling agency that provides models who reflect the diversity of “normal” (non-glamorous) Americans.
7. HC This on-line business sells wedding cake toppers that reflect the ethnic diversity of customers.

The micro-enterprise owners were all recipients of small technology grants from eBay Foundation’s Techquity Grant Program. The Techquity Grant Program offers small grants, typically around $2000, to be used for purchasing hardware, software, and training that would promote the development of micro-enterprises. The grant program was locally administered by the New Community Development Corporation (NCDC), a non-profit that provides affordable housing and business development services in the greater Omaha area. The anticipated benefit to the micro-enterprises would be more effective utilization of technology, improved thinking about technology and the role of information, and, in general, economic and human development.

Research Design

The design of the research involved seven case studies in which action research was carried out to diagnose the problem in each case, intervene to solve the problem, collect data through interviews and observations of the effects of the interventions and analyze the results in preparation for the next cycle. Action research used in this way was an iterative cycle in which the researcher begins with a plan of how to carry out the activity, then act to intervene to solve the immediate problem, observe the results of the intervention and reflect on the impact and next steps (Zuber-Skerrit, 1991, Avison et al. 1999). Carried out as part of an academic service-learning course – Information Technology for Development (IT4D), the action research was supplemented by the absorbing of knowledge through classroom lectures and discussion. The participative learning process took place in the form of group discussions in which problems were discussed and solutions arrived at collectively.

In this study, the plan was to assist the micro-enterprises through partnership with New Community Development Corporation (NCDC). The cycle continued to action or intervention, to solve the problem or manage the change process; this is where the researcher collected the data. On location at the micro-businesses, the ITD innovators worked with business owners to understand the business and existing technology, implement technology-based projects, and train business owners as appropriate. This process was referred to as “IT therapy” in which assistance was given to the micro-business owner to solve their immediate IT needs.

These steps were carried out within each case study using Klein and Myers (1999) principles. These principles guide our assessment of the action research steps taken to understand the current situation and map it on to Levy et al’s (2001) focus-dominance model. Then diagnose the problem, carry out the IT therapy interventions, collect the data and map the future state of each micro-enterprise using Levy et al (2001)’s model. This iterative data collection and analysis process was designed to enable each micro-enterprise’s ability to adopt ICTs to achieve competitiveness to be investigated. This is illustrated in the following table:

The design of this field study conforms to the principles that guide the evaluation of interpretive field studies model by Klein and Myers (1999). The Principle of the Hermeneutic Circle states that an understanding of a complex whole is obtained from preconceptions regarding the meanings of its parts and their interrelationships. Applying this principle to the current study, the parts are the researchers’ and the micro-entrepreneurs initial understandings and the whole are the shared meanings (e.g. increased awareness and acceptance of the utility that the awarded technology can help the micro-entrepreneurs in their business) that arise from the close interactions between them. The multiple interventions in the IT therapy process is supported by the view that in a number of iterations of the hermeneutic circle, a complex whole of shared meanings emerges. The Principle of Contextualization: is addressed by treating the micro-entrepreneurs as active actors (e.g. learn-
The Principle of Interaction between the Researcher and the Subjects was addressed by the close and continuous interaction of the researchers with the microentrepreneurs as described in the action research steps utilized for the data collection phase of the study (Klein and Myers, 1999).

In developing the theoretical contributions of this research, the Principle of Abstraction and Generalization guided our use of the focus-dominance model (Levy et al., 2001) which was used to provide a systematic means for understanding the historical, current as well as the future predicted IS-based positions of each of the micro-enterprises. The resource-based view of the firm helped us tie in the concept of IT therapy as a capability that when integrated with IT resources within each of the micro-enterprises may help bring about competitiveness. The Principle of Dialogical Reasoning formed the basis of the context-sensitive assistance (IT therapy) may enable micro-entrepreneur to overcome some of the technical and social barriers that they face (Klein and Myers, 1999).

Data on each case being studied was gathered through observation while implementing the IT therapy. The reflection entailed interpretation of the data, and consequences of action that then fed into the planning stage to modify the methodology or model that then determine what action would be taken in the next cycle. On their own time, the ITD innovators maintained a reflective journal, worked on assigned class exercises and readings, and prepared a technology plan for the micro-businesses. Using the techniques provided to them, the ITD innovators implemented the IT interventions by interacting closely with the micro-entrepreneurs. In this way they interacted as IT for Development (ITD) innovators as they implemented the IT and training interventions that enabled the technology to be adopted in innovative ways. The IT4D class sessions served as a sounding board for issues and proposed solutions, offered advice or relevant information, and offered constructive criticism of proposed courses of action to address any IS/ICT adoption/implementation issues specific to any of the micro-businesses. Further cycles of activities continued until a

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<td>Plan</td>
<td>Researchers’ and the micro-entrepreneurs share initial understandings in Hermeneutic dialogue. Contextualization of the social and historical background of the micro-enterprise and diagnosis of the problem to arrive at the current state of the micro-enterprise on the focus-dominance model.</td>
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<td>Act</td>
<td>IT Therapy interventions through interactions between the researchers and participants to solve the problem. Principle of abstraction and generalization adhered to through the use of two theoretical models to frame and interpret findings from this study.</td>
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<td>Observe</td>
<td>Collection of data through interviews and observations. The principle of multiple interpretations was achieved through class discussions when the ITD innovators implementing the IT interventions discussed the results in class and the second form of interpretation came from the subjects, or in other words, the micro-entrepreneurs</td>
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<td>Reflect</td>
<td>Analysis of the data and interpretation to reveal future state on the focus-dominance model. Principle of dialogical reasoning used to analyze how context-sensitive assistance (IT therapy) may enable micro-entrepreneur to overcome some of the technical and social barriers that they face.</td>
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desired end-state is achieved (Zuber-Skerrit, 1991, Avison et al. (1999, p.96).

RESULTS

The current and the future trends in how each of the micro-enterprises use their IS have been mapped onto the focus-dominance model (Levy et al., 2001) after the researchers in the study had an opportunity to discuss and observe the manner in which these small businesses carry out their activities following the action research steps outlined in the methodology section. The IT therapy phase involved the ITD innovators working with business owners to understand the business and existing technology, implementing technology-based projects, and training business owners is also mentioned. This process of “IT therapy”, or in other words, assistance given to the micro-business owner to solve their immediate IT needs, is important to the extent that it supports a major resource capability that is lacking and in much needed demand on the part of the micro-enterprises. The future IS trends for each of the businesses were based on the researchers’ understanding of the micro-enterprise’s future strategic growth plans and their IS requirements. The results were discussed with the business partners (the micro-enterprises) in the study. Following are the individual mappings for each of the micro-enterprises in the study.

- **LD**: LD specializes in high quality soups and sandwiches. During the period of this study LD moved its deli from its original location to a better one that could serve local businesses and students.
  - **Current state**: LD has high customer dominance because it is currently dependent on a specific client group. The owner of LD typically uses a PDA, Cell phone, email and a simple software package such as, QuickBookas for the business operations. The old register system is merely a calculator. It does not provide any data to the owner on trends, sandwich purchases, inventory usage, or payroll. Although, the owner is aware of the benefits of the technology the business currently possesses might bring, due to lack of skills and IT knowledge, the business is yet to exploit the technology for competitive advantage. LD’s current state of affairs makes it position itself in the efficiency quadrant of the focus-dominance model since according to Levy et al. (2001), the main focus of IS use in the efficiency quadrant is for control of the business, primarily financial control. The information systems in this con-

![Figure 3. Focus-dominance model mapping for LD](image-url)
text are concerned with improving the efficiency of internal processes.

- **IT therapy:** The ITD innovators helped the owner select a register system that will not only handle ideal usage issues (ideal usage is the total amount of use of a particular item that is an ingredient for various menu items) but also maintain payroll information—thus eliminating the problems of previously manually calculating payroll at the end of each pay period. The Internet café implementation is a work in progress. A wireless communication network through a local Internet Service provider was set up. For a small fee per month, LD will have enough bandwidth to operate 20-25 computers on the same network.

- **Future state:** LD’s biggest struggle is going to be integrating a logical inventory and database system into the business. The owner is really working hard to be innovative with the move to the new location. The owner knows what it will take for the business to be successful at this new location and part of that will be incorporating a better inventory system and a customer database. The new location will have free wireless access for customers. Eventually, the business web site will have a customer information database that will be used as an advertising and marketing tool for LD for improved customer service. Since LD is looking to grow and build its customer base, it will eventually have low customer dominance (many customers i.e. few customers will not be able to dominate the business) and moreover the owner’s intention of integrating the heart of the business which is the inventory management system with the other aspects of the business makes it position itself distinctly within the innovation quadrant. Levy et al. (2001) state that in this quadrant, the IS are a tightly woven part of the business strategy.

- **CZ:** CZ is a franchise that pairs individuals of all ages who need tutoring in any subject with tutors who can provide the service.

- **Current state:** The current state of CZ can be classified as residing in both the coordination as well as in the collaboration quadrants. CZ’s presence in the coordination quadrant arises from the fact that CZ has to deal with a large number of students and tutors and so customer dominance is low. CZ already has its own coordination components such as infrastructure, database, accounting system and

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**Figure 4. Focus-Dominance model mapping for CZ**

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marketing means from the franchiser to help it maintain its relationships with its customers (Levy et al., 2001). Additionally, CZ is viewed to reside in the collaboration quadrant since they have collaborative systems such as internal work processes using manual and automatic tools.

- **IT therapy:** The owners of CZ would like to have the process of matching tutors with students automated through online means. In addition they would like to have a software package that can take care of scheduling issues. In response to the needs of CZ, the following IT therapy interventions were carried out: creation of a decision-making framework to resolve whether it would make more sense to build the matching and scheduling system in-house versus purchasing an off-the-shelf application and customizing it to fit the needs of the micro-enterprise.

- **Future state:** CZ is heading to a possible innovation state from both the coordination and collaboration quadrants for its business. Once the owner invests money to develop their own application or purchase an existing off-the-shelf one, the business will generate exponential growth based on their current footing. Once they confirm their decision in investing capital on IT development, they will get more customers and tutors online. It will bring them financial freedom exponentially. The owner is clear as to what needs to be done to align the business strategy with the needed IS requirements to be a competitive force in the market (Levy et al., 2001).

- **HH:** HH offers a structured residence with treatment and support services to individuals who are transitioning from a treatment program back to society.

- **Current state:** HH had an office management system which included a desktop and a laptop computer. Both computers were used for normal operations such as writing assessment reports, working on Power Point, internet research and e-mail communications. The desktop was the main repository for historical records including past guest records and financial information. The desktop was
used for writing standard forms used in operations such as rules violation notices. The laptop was mainly used by the owner and is used in the same way as the desktop except in the case of the financial information. This redundancy in operations increased the ability for all employees to work on separate assignments simultaneously. Some of the functions of the laptop system were that the owner is managing progress and evaluative data in an Excel spreadsheet and used offsite for presentations and guest evaluations. In addition HH had a guest computer lab consisting of one desktop computer located in a common area. The intent of this system was to give guests a resource for looking for jobs and staying in contact with family and friends. The computers could be used for resume writing and for enhancing computer skills as well computer based training. The computer lab accessed the internet from the same wireless connection as the management system. WiFi capability in the house made the guest computer systems expandable with relative ease and low cost. The state of HH was purely in the efficiency quadrant of the focus-domiance chart since the focus was on low-cost IS to maintain operational effectiveness (Levy et al., 2001).

- **IT therapy:** In responding to the immediate IT needs of HH, the following IT therapy interventions were carried out: Streamlined business practices including system maintenance and backup of standard procedures; financial data updated and used for making proposals to prospective lenders; business input, output and outcome data updated for display to potential donors and stakeholders as well as referral services; data prepared for a database on resident statistics.

- **Future state:** HH is looking to take a phased incremental approach via coordination and collaboration to reach its desired spot in the innovation quadrant. The owners of HH realize that there is a need for better data management as well as improved communication with donors and guests and stakeholders. In attempting to move to the coordination and collaboration quadrants from their current state, HH is aware that the business will need to 1. Develop a website to get more exposure in the community and provide URL address to key stakeholders (increase customer base by reducing customer dominance and moving into the coordination quadrant); 2. Network with local education providers to allow guests to obtain needed training for the future (improve relationships with few customers i.e. local educational institutes through increased customer dominance by moving into the collaboration quadrant); 3. Work with local businesses to develop a community and a pool of potential job opportunities (improve relationships with few customers i.e. local businesses through increased customer dominance by moving into the collaboration quadrant); and 4. Present successful outcomes either in person through presentations or online through their website to stakeholders. In addition, the owners of HH want to go a step farther and maintain a strategic focus to drive them into the innovation quadrant. They would like to have innovative web-based applications that will enable online reservation capability. The website should also offer capabilities to allow referral services to contact HH and eventually develop a treatment and payment plan online through a range of treatment options and payment types. Such an IS will tie in all of their business strategies.
to show relevant outcomes to stakeholders – thus moving them towards the *innovation* quadrant as a result of aligning IS with their overall business strategies (Levy et al., 2001).

- **HE**: HE offers massage therapy services. The owner is seeking to diversify into the retail sale of a variety of natural health products.
  - **Current state**: The owner has technology already available to her, but needs help utilizing it. There was an unopened PDA, a laptop, and a desktop. The owner would like to get things organized between the two computers and the PDA. The owner wanted help learning QuickBooks and possibly setting up a company website. She needed security on her laptop and Microsoft Office 2003 installed on both computers. This business lies in the *efficiency* quadrant as it is only beginning to set-up the technology for the business and the primary focus of the IS will be for controlling the business by improving the efficiency of internal processes (Levy et al., 2001)
  - **IT therapy**: The ITD Innovators provided the following IT therapy interventions: installing Microsoft Office 2003; setting up security on the laptop computer; connecting the PDA to both the laptop and desktop; installing a CD-backup system; helping the owner learn how to organize her contact information in Microsoft Outlook.

- **Future state**: Since HE is only at the very early stages of incorporating technology into the business, the owner did not have a well thought out plan as to how the business would want to grow using the technology. The owner did express the intent to have a company website to eventually sell the company’s products.

- **EP**: EP is a modeling agency that provides models who reflect the diversity of “normal” (non-glamorous) Americans.
  - **Current state**: EP has two dimensions of the concept of customer. There are the models who sign up online that can be seen as customers and EP as the agency. The companies who require models for shoots are also customers of EP. EP has low customer dominance since it deals with a large number of models as well as agencies and so very few customers can dominate EP. EP’s current state makes it reside in the

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*Figure 6. Focus-Dominance model mapping for HE*
coordination quadrant of the focus-dominance model since according to Levy et al. (2001), the primary use of IS in the coordination quadrant is to maintain customer relationships – which is a function of the larger customer base. Typically, information systems in this context hold basic customer data.

- **IT therapy:** A major task for the ITD innovators in this case was training the business owner to help her understand the strategic importance of technology in the business. Remote desktop was installed and demonstrated to show how greater mobility and convenience could be achieved through technology. Basic workstation maintenance such as ensuring critical patches and updates were current. The differences between critical and non-critical updates were explained. Desktop security and wireless security were explained to the users. Using QuickBooks to cut down on time spent on non-value added services was explained. Website ranking and place was also explained with possible solutions. It is important to mention here that an ITD innovators role was to increase the owner’s comfort level with the technology.

- **Future state:** EP is heading towards both the collaboration as well as the innovation quadrants. It is heading to the collaborative quadrant since the owner has to maintain close contact with current clients as in photographers, ad agencies and also the listed models. Laptop and cell phone use allow the owner to have a mobile office when the owner travels, in addition to keeping in touch with clients that need models. This mode of operation is consistent with Levy et al.’s (2001) description whereby they state that businesses in the collaboration quadrant need to communicate and exchange information with major customers in a cost-efficient manner. In addition, EP is also heading to the innovation quadrant since the business model of EP relies on a web presence and is looking to be ahead of its competitors by enabling models to sign up online and get scheduled for photo shoots which will enable it to
align its core business strategy with its online presence (Levy et al., 2001).

- **HC**: HC is an on-line business that sells wedding cake toppers that reflect the ethnic diversity of customers.
  - **Current state**: The business started in the efficiency quadrant. The customer dominance is currently quite high as the business has only had a few sales and relies on a small number of customers. Although HC is an online business, the owner has minimal interaction with the business website and uses minimal ICT for day-to-day business operations. In addition, HC’s current state can be considered to reside in the collaboration quadrant since the owner of HC interacts with a small number of suppliers to obtain the cake toppers. And this trend is consistent with Levy et al.’s (2001) description since in this quadrant, the businesses need to communicate with major customers (in the case of HC, its major customers are its suppliers).
  - **IT therapy**: Some of the significant IT therapy interventions that were carried out for HC are as follows: New website – A completely new website was developed. The new website has a more organized and efficient layout comparable to other leading online competitors of similar products. Training – Training for the owner has come in the form of providing her with a manual to help add/delete products on the website so that customers will always have the new and updated product list. And most importantly, the owner will not have to depend on someone else to change the products for her – she will be able to perform the changes herself by following the steps outlined in the manual. A couple of hands-on sessions were done with the ITD innovator so that any confusion could be cleared. Perceptions and attitude changes - One of the owner’s needs is to have the business website look more “crisp” and professional. On doing some preliminary research as to the look and feel of other comparable businesses, we had to suggest to the owner to change the colors and layout of her current site to help attract more customers. We had to persuade the owner to shift away from her inefficient current layout and existing bold colors (red and black) to a more “crisper” organized layout and softer colors to help attract more customers.

*Figure 8. Focus-Dominance model mapping for HC*
Future state: HC is primarily an internet business which entails web applications. The owner understands that in order to be competitive, the business will need to take a strategic focus to carrying out business online by selling its products through a professional looking website. The owner is looking to take the necessary steps to align HC’s business strategy to its IS needs and the design and implementation of the newly developed website was the first step towards achieving that goal.

FD: FD specializes in the design of elegant, conservative women’s clothing. The owner has aspirations of being a player in the global fashion market.

Current state: FD has a laptop and an electronic cash register with some back-office software. FD currently resides in the efficiency quadrant since the owner has been using the technology available to the business for primarily basic day-to-day operational activities (Levy et al., 2001).

IT therapy: On meeting with the owner of FD and analyzing the technology needs of the business, The ITD innovators came up with the following list of items to be carried out to assist in the growth of the business: develop a website to promote its products, a developer to update and to do maintenance, and training and technical support for FD’s staff to be able to update the website regularly; FD may benefit from online free technical assistance programs.

Future state: FD’s main objective is to grow and attract new customers. The owner realizes that the only way to effectively achieve that goal is to have a web presence on the internet through a business website. The owner would like the following goals to be accomplished through the website: 1. To use it as a place to target new customers by advertising the owner’s fashion designs; 2. To sell and promote the business on the web; 3. To advertise and provide information about FD. Achieving these three goals will enable it to align its core business strategy with its IS (Levy et. al, 2001).

Figure 9. Focus-Dominance model mapping for FD
ANALYSIS

The results from the analysis indicate that five out of the seven micro-enterprises in this study start off in the efficiency quadrant in the focus-dominance model. According to Levy et al. (2001), this implies that the focus of the IS was to help reduce costs and achieve simple administrative efficiencies. On initial meetings with the microentrepreneurs, the researchers found that the business owners had no clear business strategy and was not aware of how they could derive the maximum benefit from the IS or technology that they had been awarded through the e-bay Techquity grant. Through the action research steps described in the methodology section, the researchers were able to instill an awareness and understanding of how the micro-entrepreneurs needed to align the goals of their business and how the available technology could help them reach that end state. The IT therapy process used with each of the micro-enterprises helped to address some of the immediate IT needs of the business. The immediate visible and measurable outcomes were in the area of improved day-to-day business administrative activities mainly through automation of many of the tedious manual activities. This form of outcome seems to support the view coming out from the strategic IT literature which states that one of the core ways in which IT may add value to a firm is by reducing costs incurred by the organization (Bakos and Treacy, 1986; McFarlan, 1984; Wiseman, 1988).

It can be seen that in all the micro-enterprises in this study, the final strategic position that resulted lay in the innovation quadrant of the focus-dominance model. The path to the innovation quadrant was different for each of the micro-enterprises. Depending on their context, some showed a tendency for a direct shift from the efficiency quadrant to the innovation quadrant. Whereas, others tended to take routes via either the coordination quadrant, or the collaboration quadrant, or via both. This implies that all the micro-enterprise owners are looking to integrate their IS with their business strategies by taking into consideration both internal (improving operational efficiency) as well as external (improved relationships with suppliers and customers) aspects of the business (Levy et al., 2001). This form of alignment of IS with business strategy will enable the micro-enterprises to reach a state whereby they will have a strong platform to be competitive with other businesses in their market.

The resource-based view of the firm (Clemmons, 1991; Barney, 1991; Conner, 1991; Mata et al., 1995) to explain competitive advantage provides support for not only the outcomes from this study, but also for the process by which IT therapy was used to assist the microenterprises to have the potential to be competitive. In the resource-based view of the firm, resources and capabilities may provide a unique set of competencies that may serve to address either cost reduction or product differentiation strategies to eventually create value for the organization. Applying this perspective to the context of our study, the term resources, refers to the technology that was awarded to each of the micro-enterprises through the e-bay techquity grant program. The term, capabilities, refers to the context-sensitive technical assistance or the IT therapy that was provided by the ITD innovators in the case of each of the micro-enterprises.

Integrating the awarded IT (resources) with the IT therapy process (capabilities) produces certain context-sensitive competencies (for some of the micro-enterprises these were in the form of improved awareness of IT and for some others these were in the form of immediate solutions to technical problems that helped them clear the bottleneck that they were facing) for each of the micro-enterprises that as our results show, addressed cost reduction strategies through improved administrative efficiencies. Figure 3 shows a modified version of the resource-based view of the firm that incorporates the process of IT therapy. It shows how the integration of the IT therapy process with existing IT resources within the micro-enterprises creates added value to the firm – supporting and providing a means for competitiveness with other organizations. The
effect of aligning the resources with the capabilities is illustrated in Figure 10.

This model illustrates how the IT therapy interventions bring about unique competencies that enable value to be created in the firm through cost reduction and administrative efficiencies. More specifically, the IT Therapy component of the work was focused on the entrepreneurs’ strongly perceived issues and problems: LD’s Internet connection was very unreliable; HH needed to provide better statistics to stakeholders; FD wanted to be able to show potential customers a PowerPoint show of her fashions; HE had customer information scattered in many different places; EP was frustrated by having to maintain duplicate accounting systems at work and at home; HC had ideas for enhancing her web site; CZ needed a more effective means of tracking tutors. In addition, the ITD innovators applied their skills and experiences to identify solutions to problems the entrepreneurs may not have been aware of.

The resource based view of the firm suggests that sustaining the growth of these micro-enterprises would require sustaining the skills and experience developed through the IT therapy process. Competitive advantages that these micro-enterprises gain from the direction of their growth can be stimulated through additional interventions guided by the focus-dominance model. This research has also brought to light a unique set of skills and experiences that ITD innovators can bring to bear in helping micro-enterprises achieve sustained growth and competitive advantage.

CONCLUSION

This research suggests that while micro-enterprises have the potential to serve as the seedbed for economic development, they must overcome a number of challenges that obstruct their path. Very few micro-enterprise entrepreneurs possess the technical skills or information systems necessary to streamline their business operations and help them compete and expand into new markets. This is why they need interventions by ITD innovators who can give them the skills that enable the micro-entrepreneurs to diagnose business problems, design IT and training interventions and implement processes to support IT adoption. An innovative approach was developed by integrating context-sensitive technical assistance, or in other words, “IT therapy” with existing IT resources in micro-enterprises to show how these small businesses may become competitive. This research has investigated how through the process of context-sensitive IT assistance has the potential to enable micro-enterprises to achieve competitiveness. This research is based on an interpretive field study method of inquiry as outlined by Klein and Myers (1999) with data collection being carried

Figure 10. Model of micro-enterprise growth
out using action research steps (Zuber-Skerrit, 1991; Avison et al., 1999). This paper used the Focus-Dominance model to investigate the adoption of ICT for competitive advantage by a set of seven micro-enterprises and the resource based view of the firm to develop a model of micro-enterprise growth. Further research needs to consider the effect of multiple interventions across a broader range of micro-enterprises over time through a longitudinal design.

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