Development Outcomes from IT Adoption in Micro-Enterprises

Mehruz Kamal, Travis Good and Sajda Qureshi
College of Information Science & Technology
University of Nebraska Omaha
mkamal@mail.unomaha.edu

Abstract

The ability of micro-enterprises to adopt IT can potentially increase their growth by 3.4% according to a World Bank expert. However, these gains do not always take place as the challenges are many. In order to identify how IT adoption can lead to growth in micro-enterprises, this paper develops upon the IT adoption categories discovered in a prior research effort in order to arrive at development outcomes. Following an open coding analysis of the results of a focus group session in which a group of micro-enterprises participated, this paper discovers the relationships between the IT adoption categories and development outcomes. The contribution of this paper is in the discovery of the relationships between IT adoption and development outcomes in the form of a conceptual model.

1. Introduction

Small businesses play an important role in economies all over the world by creating jobs and contributing to the socio-economic development of their communities. According to Grosh and Somolekae [10], micro-enterprises contribute to industrialization in at least two ways. First, they graduate to become larger companies; and second, owners of micro-enterprises can accrue capital to be passed onto the next generation to start bigger businesses. In Nebraska, 87% of the economy is comprised of these very small businesses that are primarily run by one to five employees. Although they are the dominant form of business, they are hindered from growing due to a myriad of challenges that they face. One of the key challenges that micro-enterprises encounter is the adoption of information technology (IT). According to Qiang et al.’s [28], research, the adoption of IT can potentially increase business growth by 3.4%.

Yet IT adoption has been a challenge for small and medium-sized (SME) businesses according to authors such as Schreiner and Woller [38], Sanders [36], Lichtenstein and Lyons [19], Hyman and Dearden [14], Honig [13], Piscitello, and Sgobbi [26]. This is an even bigger challenge for micro-enterprises since they are one person organizations and have a lack of resources and necessary support structures according to Wolcott et al. [45], Mansell and Wehn [20], Hazan [12], Owen and Darkwa [25], Baak and Heeks [3], Latchem & Walker [18], O’Farrell et al. [24], Barton and Bear [4].

A study by Qureshi et al. [29] discovered that the intent to adopt IT by micro-entrepreneurs was a result of their experience with the technology. This finding lead them to develop ‘Technology attitude groups’ that help explain how different micro-entrepreneurs have varying attitudes towards IT and how their attitudes drive their use of IT. Armed with this new insight, it then appears that the next logical step would be to investigate how a micro-entrepreneur’s attitude towards IT may help grow their business. This is where the main contribution of this paper lies. The research question being investigated in the paper is: How can IT adoption by micro-enterprises enable development outcomes to be achieved? This paper addresses the research question through open coding analysis of the results of a focus group session in which a group of micro-entrepreneurs participated. The results of this study reveal relationships between the Technology attitude groups and development outcomes. The contribution of this paper is in the discovery of the relationships between IT adoption and development outcomes in the form of a conceptual model.

2. Theoretical Background

2.1. Small Business and IT

Through the analysis of multiple interpretive case studies, Qureshi et al. [31] has shown that Information and Communication Technologies (ICTs) can help businesses gain better access to information and expertise, reach new markets and customers (or more generally, stakeholders), administer the business more efficiently and effectively, and grow in the knowledge and skills needed to run the businesses better. For small businesses to be able to reap the potential benefits of IT, Brady et al. [47] state that IT needs to be understood from an economic, management, as well
as from marketing perspectives. In addition, Barba-Sanchez et al. [46] mention how a broad view of ICTs can stimulate small businesses to adopt new technologies, create innovative products, and be competitive. Nevertheless, micro-enterprises face a host of challenges in adopting and using ICTs.

Despite the fact that IT can bring about substantial benefits to firms as per Qiang et al. [28], Raymond et al. [33], and Southwood [39], the scenario is very different for micro-enterprises. For these very tiny businesses – that mostly have just one owner – IT use has been very minimal. Results from a World Bank study done by Qiang et al. [28], showed that email and web use (email - 27%; web - 22%) for conducting business was the lowest among micro-enterprises. It then appears that these types of businesses are not able to harness efficient computer use or effectively network with other businesses using IT. Wolcott et al. [45] and Qureshi et al. [30] have shown that, even when the group of micro-enterprises under study was awarded certain technologies through a technology grant program, the boxes containing the new IT devices were unopened - after six months! Those studies revealed that despite the micro-entrepreneurs’ appreciation of the benefits of technology, this was not sufficient to drive them to incorporate and use the new IT. Wolcott et al. [45] and Qureshi et al. [30] conclude that the two key reasons to explain this behavior are that, on the one hand, micro-enterprises face numerous technical and non-technical challenges, and on the other hand that they are intimidated by the breadth and depth of available options.

2.2. Information Technology for Development

It has been acknowledged by researchers and development agencies that Information Technology (IT) is playing an increasing role in facilitating development. Steinberg [40] suggests that the high versatility of ICTs has the potential to address a country’s development strategies - provided an enabling environment exists. As per Qureshi et al. [31] the field of Information Technology for Development (ITD) is built on this notion and involves the implementation, use and management of Information Technology infrastructures to stimulate human, social and economic development. IT for Development research is not limited to developing countries; it also considers communities and regions in which people have limited access to funds, social services and education needed to sustain themselves; there are underserved regions within developed countries as well. Researchers in the field of ITD have investigated various ways and in various use contexts the manner in which IT may help to bring about development as indicated by Rodrigues and Govinda [35], Rodrigo [34], Scheepers and de Villiers [37], Braa et al. [5], Mosse and Sahay [22]; Kimaro and Nhampossa [16], Chudnovsky and Lopez [7], Tan and Leewongcharoen [41]; Cecchini and Scott [6], Kenny [15]; Walsham and Sahay [44], Qureshi [32], Nidumolu [23], Preis-Hjeest al. [27], Hawk and McHenry [11]. To highlight some of the main contributions of this area, it can be said that through IT, underserved populations have an opportunity to access information, knowledge and expertise through the use of tele-centers and tele-kiosks. IT has also enabled access to global and local markets enabling small firms in developing countries to compete with and partner with bigger firms in developed countries –as evidenced by the increase in off-shoring practices. At a micro-scale, IT has helped to improve administrative efficiencies through automation and computerization of many of the day-to-day manual business activities leading to increased transparency and faster processing of information. It has also been acknowledged that as the costs of Internet service provision are reduced through privatization, IT will have greater impact on poverty reduction Kenny [15]. On a macro economic level, through her model of IT for development, Qureshi [31] suggests that when IT implementations and interventions impact business activities, a number of resulting effects can be brought about such as better access to information and expertise, increased competitiveness and access to new markets including global markets, administrative efficiencies from low transaction costs, and increase in labor productivity through learning and poverty reduction.

2.3. IT Adoption

IT adoption is one of the most researched concepts in the field of Information Systems. Numerous theories, frameworks and models have been developed to help explain how adoption of IT takes place as described by Ajzen and Fishbein [2], Ajzen [1], Davis [9], Thompson et al. [42], Moore and Benbasat [21], Compeau and Higgens [8], Venkatesh et al. [43]. Despite the rich insights provided by the aforementioned studies, it was shown by Qureshi et al. [29] how prior studies in IT adoption fail to fully explain IT adoption behavior in micro-enterprises. In addition, Qureshi et al. [29] develop ‘Technology attitude groups’ to help explain the attitudes that groups of micro-entrepreneurs experience in regard to IT. The groups are distinguished from one another by the extent to which they perceive technology as applicable to their businesses.

Since the aim of this study is to identify how IT adoption can lead to growth in micro-enterprises, this
from Qureshi et al. [29] are summarized below:

- **Positive Limited**: Micro-entrepreneurs in this group see the value of IT and are willing to adopt it, but lack the capabilities and support to proceed further.

- **Positive Specific**: Micro-entrepreneurs in this group tend to have a split perspective; they perceive technology as beneficial in some areas (e.g. acquiring access to new customers through the web) but have doubts about other areas.

- **Positive Holistic**: Micro-entrepreneurs in this group display a positive attitude towards IT in general and have no significant reservations.

For the development construct, we have chosen to take the four ICT effects from the model of IT for development outlined by Qureshi [31], as our development outcomes. The model in Qureshi [31] is an appropriate starting point due to its being theoretically linked to IT interventions and corresponding social and economic development impacts. It suggests that when social and economic development activities are able to benefit from ICT implementations, the ICT effects that result are improved access to new markets, increased access to information and knowledge, administrative efficiencies, and increased productivity.

The ICT effects from the model in Qureshi [31] serve as constructs for our study and provide broad coverage of potential development outcomes; this coverage is helpful for framing the focus group session, and subsequent data analysis of that session.

The constructs are described below:

- **Access to new markets**: This construct is a result of numerous studies that have shown that information and communication technologies provide a means to reach both local and global markets. As a consequence, there may be increased revenues, for example, for local farmers who are suddenly able to conduct business outside their geographic locale.

- **Access to Information and Knowledge**: It has been shown that in order for both social as well as economic development to take place, having access to right information is a key issue. Past studies have shown how tele-kiosks placed in rural villages have helped villagers obtain crucial economic and social data.

- **Administrative Efficiencies**: This construct refers to automation of the many routine manual tasks that are performed in businesses that take time away from more important business issues. Within the development context, computerization of many tasks has resulted in increased transparency and quicker processing times.

- **Productivity**: This development construct refers to the ability to do more with fewer resources. In addition, it also implies being able to learn new ways to do business using information technology.

### 3. Methodology

This study uses a qualitative approach to gather and analyze the data following an interpretive research strategy as per Klein and Myers [17]. An interpretive research strategy will enable data gathered to be analyzed and generalized to develop either, concepts, theory, specific implications, or rich insight as per Walsham, 1995 [45]. The data collected through a focus group for this research was analyzed through an inductive process using the guidelines for good interpretive research. According to Klein and Myers [17], Information Systems research can be classified as interpretive if it is assumed that our knowledge of reality is gained only through social constructions. The principles of interpretive research [17] that were adhered to were 1) the principle of contextualization, 2) the principle of interaction between researchers and the subjects, 3) the principle of dialogical reasoning and 4) the principle of multiple interpretations. The unit of analysis for this study was the individual micro-entrepreneur; due to the small size of micro-enterprises the micro-entrepreneurs’ views represent those of his/her business. The researchers observed and transcribed the narrations made by the business owners during the focus group session. The transcriptions depict the social and historical backgrounds of each of the micro-businesses as specified by the principle of contextualization (Klein and Myers) [17].

The principle of interaction between researchers and subjects was achieved through the focus group session. The focus group was conducted by the authors in Lyons Nebraska where a diverse set of micro-entrepreneurs came together to discuss the challenges they faced with IT. The choice of micro-enterprises in the focus group was purposive. According to Patton [50], sampling in qualitative research is purposeful rather than random as in quantitative research. In purposeful sampling, information-rich cases are selected carefully and strategically; the specific type and number of cases selected depends on the study’s purpose and resources, as per Patton [50]. The specific criteria used were that each business had only 1 – 5 employees and that each business owner had experienced some interaction with IT.

The brainstorm questions the researchers posed to the entrepreneurs were 1) As you think about acquiring and using information technology to benefit your
company, which kinds of challenges do you encounter?, 2) If the challenges you mentioned were mitigated, how would you envision using technology within your company? After each brainstorm the third author who conducted the focus group, facilitated the brainstorm and helped arrive at some major categories for voting. The first author typed up the brainstorm categories and managed the clickers (a technology used for obtaining anonymous input from a group of people on issues) for voting. The second author typed up the transcripts of the discussion that were coded for the purpose of this paper. The questions that were posed to the focus group participants coupled with the facilitation provided by the researchers during the session served to “socially construct” the descriptions that each of the micro-entrepreneurs provided. This corresponds to Klein and Myers’ [17] principle of interaction between researchers and subjects.

The focus group consisted of micro-entrepreneurs who had a diverse set of backgrounds and success with their micro-enterprises. They had varied experiences with technology. They were different ages and possessed different skills. Their economic means varied widely. Table 1 lists the micro-entrepreneurs who participated in the focus group.

| JB – Large equipment manufacturer  |
| DJ – owns as flower and gifts shop  |
| MA – owns a hardware store  |
| JP – manages a funeral home  |
| KS – owns a family daycare  |

| MF – manages the local library  |
| LM – owns a dress shop  |
| JJ – owns a farm business  |
| FH – Superintendent of local school  |
| BG – owns a stoneware and pottery business  |

Table 1: List of Micro-entrepreneurs

The coding was carried out independently by the first and second authors to interpret the meanings in the transcripts as they related to the ways in which IT can be used in innovative ways to bring about development. Having two independent researchers code the focus group transcripts serves as a basis for inter-coder reliability and a stronger foundation for the analysis of the results. The IT for Development constructs that were used were Access to new markets, Administrative efficiencies, Access to information and knowledge, and Increased labor productivity. These constructs come from the model of IT for development derived through a multiple interpretive case study by Qureshi [31]. The two independent coders identified these constructs in the transcripts when the business owners talk about what they would like to obtain for their businesses from incorporating IT. The researchers then integrated their versions of the coding in order to

<table>
<thead>
<tr>
<th>Code</th>
<th>Construct</th>
<th>Definition of Code</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Access</td>
<td>Access to new markets (Qureshi 2005)</td>
<td>Ability to use IT to access new markets</td>
<td>“we use our website to get access to new customers”</td>
</tr>
<tr>
<td>Admin Efficiency</td>
<td>Administrative Efficiencies (Qureshi 2005)</td>
<td>Use of IT to make business more efficient</td>
<td>Use of excel, QuickBooks etc</td>
</tr>
<tr>
<td>Info Access</td>
<td>Access to information and Knowledge (Qureshi 2005)</td>
<td>Use of IT to access information, expertise or knowledge relevant to the business</td>
<td>Use of search tools to find information</td>
</tr>
<tr>
<td>Productivity</td>
<td>Increased labor productivity (Schumpeter, Qureshi 2005)</td>
<td>Ability to do more with fewer resources. Learning new ways to do business using IT</td>
<td>New business through IT, learning new skills and techniques to help with business</td>
</tr>
</tbody>
</table>

Table 2: IT for Development Outcomes
produce a shared understanding about the potential development outcomes described by the micro-entrepreneurs.

During the coding and analysis phase of the study, the researchers attempted to reconcile different viewpoints with respect to the coding constructs themselves. This resulted in a conceptual linkage among specific potential IT for development outcomes and micro-entrepreneurs belonging to certain “Technology attitude groups” (Qureshi et al.) [29]. The following two sections describe and help explain the results obtained.

4. Results

The results from the coding of the focus group session are shown in Table 2. The numbers represent the occurrence frequency of comments related to the potential development outcomes.

The ratios show a tendency for micro-entrepreneurs in the Positive limited technology attitude group to focus on Productivity gains associated with technology adoption.

<table>
<thead>
<tr>
<th>Positive Limited (Envisioned Outcome Percentages)</th>
<th>MarketAccess</th>
<th>AdminEff</th>
<th>InfoAccess</th>
<th>Productivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>DJ</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>40%</td>
</tr>
<tr>
<td>KS</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>40%</td>
</tr>
</tbody>
</table>

4. Analysis

The ratios of development outcome expectations (Tables 4, 5, and 6) seem to indicate that the technology attitude groups describe by Qureshi et al. [29] have different expectations about what technology can add to a business. Conceptually, this may be related to their level of experience. Members of the Positive Limited technology attitude group have seen computers performing routine tasks, but have little understanding of the knowledge capabilities associated with the World Wide Web, for instance. Members of the Positive Specific technology attitude group, have used computers for certain tasks, but may lack training or awareness of other potential uses of IT. Members of
the Positive Holistic technology attitude group may have a broad appreciation of IT, but lack specific knowledge and resources necessary to fully integrate IT into their businesses. To clarify how these connections arose from the transcript of the focus group, we have assembled quotes in the following subsections from the session drawn from micro-entrepreneurs that fall within each of the technology attitude groups. This also leads to the development of conjectures on the basis of which these groupings are connected to the development outcomes investigated in this paper. Figure 1 below shows the links between the technology attitude groups and development outcomes.

**Figure 1. Conceptual model**

The following subsections illustrate through quotes from the focus group session transcript the attitudes for each of the groups.

**Positive Limited**

This quote represents the attitude of micro-entrepreneurs in this group:


**Conjecture 1 (Low Enthusiasm):** Micro-entrepreneurs in the Positive Limited technology attitude group tend to have low enthusiasm for technology and to perceive limited potential development outcomes associated with it. These micro-entrepreneurs associate technology use with basic productivity gains. A possible reason may be that they do not understand the potential for the Internet to inform their business decisions as well as open up new markets. A productive intervention for these micro-entrepreneurs might be to provide them with such awareness via a class or seminar.

**Positive Specific**

The following quotes represent the attitude of micro-entrepreneurs in this group:

JB: “We do business all over the world with our website” (Development outcome: Market Access).

MA: “90 [different] supplies are ordered through Internet suppliers” (Development outcome: Information Access).

**Conjecture 2 (Mild to moderate enthusiasm):** Micro-entrepreneurs in the Positive Specific technology attitude group tend to have mild to moderate enthusiasm for specific development outcomes. These micro-entrepreneurs have specialized interest areas where they believe that technology can assist them. Market access is the most important goal for this group, followed closely by the goals of Information Access and Productivity. These business owners may have a greater appreciation for technology’s applications than members of the Positive Limited technology attitude group, but they would still benefit from an awareness class/seminar.

**Positive Holistic**

The following quote represents the attitude of micro-entrepreneurs in this group:

JJ: “Was always interested in computers, farm record keeping in Excel spreadsheet” (Development outcome: Administrative Efficiency).

JP: “we have [created] links [on our website] as far as resources places lodging, local florist, cemeteries, names of churches” (Development outcome: Market Access).

MF: “We have helped with Medicare insurance plan searching for seniors” (Development outcome: Information Access).

FH: “Want to use tech to advance education of students” (Development outcome: Productivity).

**Conjecture 3 (Broad Enthusiasm):** Micro-entrepreneurs in the Positive Holistic technology attitude group tend to show a broad enthusiasm for development outcomes, though they may lack the knowledge and resources necessary to fully integrate IT into their businesses. A meaningful intervention for
this group of business owners might be to nurture and sustain their interest in IT while providing them with resources to incorporate IT into their businesses. Wolcott et al. [45] describe an innovative process of “IT Therapy” as a means to help micro-enterprises adopt IT.

The above analysis of the three attitude groups illustrates how interventions can be applied to micro-enterprises. An understanding of technology attitude groups may facilitate interventions to aid these groups in overcoming IT hurdles and moving to the next stage of growth and development.

It appears that different Technology attitude groups (Qureshi et al.) [29] have different understandings of capabilities of technology. For example, some business owners with limited exposure to technology see it only as a productivity aid, whereas others with more exposure see IT as a means to enter new markets. Despite the differences in micro-entrepreneurs’ understanding of how IT may benefit their businesses, they all seem to converge on the notion that using IT in some way will help their business. Our analysis seems to suggest a conceptual model that depicts the behavior expressed by our set of rural micro-enterprises as related to IT adoption and potential development outcomes (figure 1).

Figure 1 shows that there is a relationship between a micro-entrepreneur’s attitude towards IT and development outcomes that might arise within his/her business as a result of IT adoption. However the extent to which the development outcomes are achieved for the technology adoption groups is illustrated in the arrows that link these groups to the specific development outcomes. Micro-entrepreneurs in the Positive specific category tend to benefit more from new market access and would be adopters of websites for example. Micro-entrepreneurs in the positive holistic category would tend to benefit more from technologies that enable information to be accessed such as the use of search engines and portals. The micro-entrepreneurs in the positive limited category would benefit from IT to achieve productivity gains such as through software for bookkeeping.

It is important to emphasize here that although we posit a relationship between our technology attitude group construct and our development construct, we have not drawn conclusions as to the direction of the relationship between the two in our conceptual model. In other words, it is yet to be investigated whether adoption attitudes lead to IT adoption and bring about business development, or whether perceived business development outcomes foster changes in attitude?

While the causality is uncertain, the characteristics of these businesses nonetheless lend themselves to certain conjectures about what kinds of interventions may be helpful to grow these very small businesses in the future. As it turns out, these characteristics tend to suggest that rural micro-entrepreneurs may be most effective in growing businesses if they gain a broad perspective on technology. The extent of technology knowledge within each technology attitude group seems to be associated with specific development outcomes, with the breadth of envisioned outcomes increasing alongside the knowledge.

6. Implications for micro-enterprise growth

Our analysis leads us to suggest a number of implications and guidelines to help address micro-enterprises’ needs in terms of IT adoption and bringing about business growth.

One such guideline would be to make provisions through local universities or non-profit organizations to provide seminars for micro-enterprises to increase their awareness towards IT and show them how technology can help their business.

Our results suggest (Table 3) that there was a strong consensus that the micro-enterprises needed to reach new markets. A potential guideline here would be to make business owners aware that the Internet is highly collaborative in nature and that they can use Internet technology build partnerships with other businesses to accrue many benefits. This would help these small businesses enhance their market reach to potential customers through business-to-business collaborations over the Internet.

The other ‘large’ problem perceived by the micro-entrepreneurs was a lack of time. This might be addressed by a technology intervention involving the creation of a common technology platform to create administrative efficiencies for these businesses for ‘bread and butter’ business tasks like accounting. The business owners could be referred to community college and/or regular college training classes to train on said platform.

7. Limitations

It is important to point out that although the current study makes a significant contribution through the discovery of the connection between IT adoption categories and development outcomes of micro-
enterprises, the researchers do not however claim that the categories of IT adoption or of development outcomes are exhaustive. The applicability of the constructs is constrained by the sample size available and the inductive process used to evaluate the sample.

Despite this limitation, it is also important to note that the methodology used in this study is qualitative in nature and bottom-up. In other words, the results and analysis is very strongly tied to the data and the conclusions have been derived bottom-up from the data. As per Strauss et al. [48], the coding process used in the study allows the researchers to apply their theoretical sensitivity to make sense of the data. Future focus groups may reveal other adoption categories. But as for the IT adoption categories discovered and developed in this current study, they are heavily rooted in the data and represent the actual context from which they were extracted.

8. Conclusion

Micro-entreprises are crucial contributors to the economy, both in developed as well as in developing countries. Nonetheless, research has shown that they are often ill-adapted to the technological demands of the modern economy. In this study we used inductive reasoning, coding and classification to expand upon earlier research by Qureshi et al. [29] that put micro-entrepreneurs into technology attitude groups. We tied these attitude groups into a conceptual model of development outcome expectations, concluding that most of the entrepreneurs had limited and specific expectations concordant with their previous limited and specific technology exposure. Finally, we made some conjectures about the kinds of interventions that would be most suitable for these entrepreneurs. Future research will focus on testing and clarifying both the aforementioned technology attitude groups and the model tying the groups to specific outcome expectations. The hope is that a robust model will facilitate successful and sustained technology interventions in the future.

9. References


[48] Strauss, A. and Corbin, J. *Basics of Qualitative Research: Grounded Theory Procedures and*
