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Abstract

While it is widely accepted that the increasing interconnectedness of the world economy has been fueled by the innovative uses of Information and Communication Technologies (ICTs), little attention has been paid to the increasing inequalities within developed and developing countries. These inequalities manifest themselves in the form of communities in which incomes are considerably below the rest of the country and there is a rise in poverty. This paper investigates this trend by taking a community capital perspective to investigate how ICTs may or may not enable businesses to grow. As micro-enterprises are seen to contribute to the growth of their communities, they are the unit of analysis for this study. Following a grounded theory analysis of micro-enterprises in two communities, this paper builds a theory of how the use of ICTs by micro-enterprises can lead to community capital. The contribution of this paper is in discovering community capital outcomes for the ways in which ICT adoption by micro-enterprises can lead to development. This has implications for the ways in which ICT for development efforts can be sustained through the growth of micro-enterprises and their communities.

INTRODUCTION

Research has shown that micro-enterprises contribute to the development of communities when they grow and create jobs. Vargas (2000) found that a number of factors are critical for micro-enterprises to grow and contribute to sustainable community development. She found that sustainable, community-based micro-enterprises are strongest when they involve the whole

community. When micro-enterprises adopt Information Technology (IT), their growth can increase by a factor of 3.4% (Kamal, 2009; Qiang et al., 2006). The micro-enterprise has become the main unit of analysis when assessing the effects of Information and Communication Technologies (ICTs) on development outcomes (Duncombe and Heeks, 2002; Qiang et al., 2006, Qureshi et al., 2008, 2009, 2010; Qureshi and York, 2008; Kamal, 2009; Good 2011). Qureshi et al. (2008) found that development takes place when ICT interventions in micro-enterprises lead them to increased competitiveness, administrative efficiencies, information access, and access to new markets. Micro-enterprises play a very important role in generating jobs, developing business skills, and providing needed goods and services to a community (Kamal and Qureshi, 2009; Duncombe and Heeks, 2002; Daniels, 1999). Good (2011) found that the introduction of technology to under-developed communities has great potential to facilitate human, social, and economic outcomes by connecting these communities to networks of resources that would otherwise be out of reach.

Castells (2004) argues that while globalization and the increasing interconnectedness of businesses is brought about by ICTs, there is a rise in disparities in incomes within developed and developing countries and a rise in poverty (in Qureshi 2011). Information systems (IS) are often relied on to assist growth, although small businesses often find technology difficult to implement due to resource constraints (Street and Meister, 2004; Raymond, 1985). Kamal and Qureshi (2009) explore two trends relating to how ICT adoption in micro-enterprises can bring about development.   First, micro-enterprises contribute to both economic and social development. Second, ICT can facilitate achievement of an underserved region's development strategies. However, as stated by Kamal and Qureshi (2009), while the majority of research investigates these two trends, few studies focus on the intersection of these two development trends. Research in IT for Development has shown that community capital is important in enabling ICTs to be used for developing human capital, social capital, and economic capital.

Additionally, micro-enterprises have shown the potential to bolster communities through income generation and hiring (Good, 2009; Servon and Doshna, 2000). We have found that adopting ICTs in micro-enterprises is a necessary step in increasing these components of community capital. The challenge is to create or increase their ICT usage, which will help lead to thriving communities. This has opened up a gap in the literature on how this perspective can be used to support micro-enterprises.

In order to investigate this gap in the literature, this paper follows a community capital perspective to investigate the intersection of these two development trends. Micro-enterprises have shown the potential to bolster communities through income generation and hiring (Good, 2009; Servon and Doshna, 2000). Community capital is a combination of economic, human, social, and ecological capital (Hancock, 2001). Understanding this form of capital is important in addressing how these communities can grow through the adoption of ICTs by micro-enterprises. This contributes to what we know about how ICTs contribute to development (Brown and Grant, 2010). Additionally, development is investigated in terms of the ICT effects, such as access to information or new markets leading to increases in income and/or job creation (Qureshi, 2005).

In order to address this gap in the literature, the research question we investigated is: how can the use of ICTs by micro-enterprises lead to community capital? In order to investigate this research question, we collect data through in-depth interviews from three micro-enterprises in developing communities in a mid-western USA metropolitan area. We selected two communities for this research because the income and education in the communities are below the average when compared to the entire city (we will hereby refer to these communities as "community N" and "community S"). We collected data in these communities through in-depth interviews and analyzed the data using grounded theory open coding to arrive at categories, and axial coding to build theory. The contribution of this paper is in a causal model of community capital.

THEORETICAL BACKGROUND

One key distinction is to recognize the difference between technology "for development" and technology "in developing" countries. Often people combine these two concepts into one, but Brown and Grant (2010) stress that these are two distinct streams of research. In the context of our studies, we will look at how ICTs can improve development for micro-enterprises. While we are not looking at the concept of "in developing" countries, we recognize that these micro-enterprises are in developing communities, which shares similar characteristics to a developing country, such as high levels of poverty and lack of ICT access. Thus, we are looking at ICTs both for development and in developing communities.

The social concept of development suggests that people participate in improving their circumstances through the development of healthcare, education, environment, and community

services (Qureshi, 2005; Hamelink, 1985).   Qureshi (2005) provides a model showing the cyclical process where social and economic development take place. This model shows that social development can call upon ICT principles to increase human and economic growth, which in turn leads to expansion of ICT, thus increasing economic development. Because of the nature of the model, the effects are interrelated and cyclical. One thing that is not included in this model is that as these levels of capital increase, they contribute to an increase in community capital. According to Walsham and Sahay (2006), most studies focus on the public and private sector. However, they found a lack of studies that focus on community development, and we will address this gap.

Many researchers have looked at the effects of ICT on development, and many researchers have created models that show this effect. Qureshi (2005) shows these effects in her model, which depicts how social development can call upon ICT principles to increase human and economic growth, which in turn leads to expansion of ICT, thus increasing economic development. Because of the nature of this model, the effects are interrelated and cyclical. The problem for micro-enterprises is that they face many challenges in taking advantage of ICT. Duncombe and Heeks (2002) found that micro-enterprises faced challenges in gaining ICT access, paying for ICT, and skills using ICT. ICTs can help to empower people and increase education, which leads to the ability of people to make the economy more prosperous, according to Qureshi and Trumbly-Lamsam (2008).

Community Capital

The key concept that brings together the community perspective in a way that enables an understanding of how ICTs can affect development is the concept of community capital. Community capital is a combination of economic, human, social, and ecological capital (Hancock, 2001). Increasing each component leads to the development of community capital, which will lead to healthier, thriving communities (Hancock, 2001). The communities that learn how to build all four forms of capital simultaneously will be the communities that thrive (Hancock, 2001). This concept has been researched in the field of IT for Development in a number of ways. Bailey and Ngwenyama (2010) have shown that community telecenters enabled multiple generations to support each other in Jamaica. Puri and Sahay (2007) investigated how active involvement of communities in the development of an online information portal for rural farmers enabled them to be more empowered and knowledgeable in their use of ICTs to support

their local needs. In Puri and Sahay (2003), the participation of community members in the form of free and frank dialogue among local residents enabled better integration for knowledge and its use in the Geographic Information System (GIS) developed for better water management. Molony observed that ICTs provide tools that give micro-enterprise owners a competitive alternative, increasing social capital. Human development (capital) increases because of increasing the capacity or abilities to use ICT (Kivunike, Ekenberg, Danielson, and Tusubira, 2011). Andrade and Urquhart (2008) observed that there is a strong link between human capital and social capital.

Economic capital is assessed in terms of an increase in income, which leads to job creation, which leads to more clientele (Qureshi, 2005; Qureshi and Kamal, 2009). Hancock (2001) sees that the use of economic capital constitutes the means to attain human and social goals. To understand economic development in micro-enterprises we can ask business owners if they broke even last year and if they think they will break even this year. By increasing economic development, micro-enterprises can gain administrative efficiencies, access new markets, and new clients, which lead to micro-enterprise growth (Qureshi, 2005). Hancock (2001) also says that economic capital leads to an increase in human and social capital.

Human capital is defined by Sen (1999) as "human qualities that can be employed as 'capital' in production". Hancock (2001) believes that human capital "consists of healthy, well educated, skilled, innovative, and creative people who are engaged in their communities and participate in governance". This means that increasing education and ICT knowledge equates to developing human capital. Sen (1999) observed that people become more efficient as they become more of a commodity in production. This adds value to the production and in turn, the income of the person (increased economic capital). When people are more educated they will often be more skilled in using ICTs. Increasing individual skills, ability, and freedoms can lead to increases in community capital.

Social capital is defined by Coleman (1988) as "a variety of different entities, which consist of some aspect of social structures, and they facilitate certain actions of actors within a structure". Hancock (2001) defines social capital as "the 'glue' that holds our communities together". Coleman (1988) identified three variables that affect social capital. The first variable includes obligations and expectations. This variable depends on two elements: trustworthiness

of the social environment and the actual extent of obligations held. The second variable includes information channels. This refers to social relations that constitute a form of social capital that provides information that facilitates action. The last variable is social norms, which he suggests one should forgo self-interest and act in the interests of the collectivity (in our case, the community). Taking these variables can lead to a couple of outcomes. Hancock (2001) and Coleman (1988) observed that when social capital increases, it creates or increases human capital. Coleman (1988) also sees that when education increases, it leads to economic development, which then leads to an improvement in community relations.

Ecological capital is defined by Hancock (2001) as "the results of reducing the environmental impact of energy use". Ways to increase ecological capital are creating community gardens and sharing of products. Often people are unaware of ecological capital, so we can ask if people turn off their lights and equipment when they leave their office (lower energy costs, save money, save energy), or if they share resources with other community members. Increasing ecological capital can lead to an increase in human capital (Hancock, 2001).

Vargas (2000) sees a few factors that are critical for micro-enterprises to grow and contribute to sustainable community development. She found that sustainable, community-based micro-enterprises are strongest when they involve the whole community. Another part of this is that participation of the community in decision-making processes that will affect it can enhance ownership and empowerment as well as the richness of alternatives. The cases she examined showed that a successful strategy is to bring together the elements of sustainable development with the importance of the key fact that the micro-enterprises are community based.   With community development, increased community support among businesses, individuals, and leaders, create stronger social networks. This leads to increased social capital, or the cooperation and support among family and community members exemplifying the importance of using a community-based approach to micro-enterprises (Vargas, 2000).

To investigate ICT adoption using the community perspective we describe how adoption of ICTs can enable sustainable development to take place. The methodology section describes the community in which adoption of ICTs in micro-enterprises will be investigated.

Sustainable Development from Adoption of ICTs in Micro-enterprises

Often ICTs can provide innovations and solve problems, but in many micro-enterprise environments, ICT is underutilized or they do not adopt ICT at all. This creates a few questions about ICT use in micro-enterprises in community S and community N. First, what technologies do they use, and how often do they use them? Second, how are they using ICT? Third, what are the outcomes of using ICT? Interviewing micro-enterprise owners is the only way to answer these questions, so our research can focus on micro-enterprise development locally. Often the biggest reason for micro-enterprises to adopt a website is to improve social contact (with customers, vendors, etc.), according to Riemenschneider et al. (2003). Qureshi et al (2009) provided three outcomes from the use of ICT in micro-enterprises. First is that they gain access to information, knowledge, and expertise. Duncombe and Heeks (2002) find that the role of ICT in enabling information and knowledge is important for social and economic development. Second, the micro-enterprises increase their competitiveness and access to new markets. ICTs enable access to both global and local markets. Next, micro-enterprises increase their administrative efficiencies. As more people gain access to the internet, new opportunities for development emerge. Third, they can contribute to poverty reduction. As researchers, we can help reach these results in two ways. First, we can diagnose their problems and analyze where ICTs can help them. Second, we can provide innovation for individuals and businesses that would not have the vision or knowledge to use the technology. This will help empower businesses and will lead to an increase in learning and labor productivity.

Qureshi and York (2008) identified four factors that lead to IT adoption in minority and ethnic communities. The first is behavioral control, which is the owner's belief in their ability to select and manage their IT needs. The second factor is the knowledge and attitudes toward IT adoption. The third factor is the degree of ethnic identification and subjective norms. The latter is the preferred learning style of the business owners, which can differ depending on the owner and community.

These perspectives show how ICT adoption can lead to development within micro-enterprises. Individual acceptance of a technology has been a long-debated concept. Davis (1989) created the Technology Acceptance Model (TAM), which uses many constructs to explain individual acceptance. He tailored TAM to IS contexts, and designed it to predict IT acceptance and usage on the job (Venkatesh et al., 2003). The model comprises three separate

constructs. These constructs from theories of individual acceptance appear to be relevant to developing an understanding of how micro-enterprises can adopt ICTs.

The first construct is *perceived usefulness*, which is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989; Venkatesh et al., 2003).   Riemenschneider et al. (2003) found three questions regarding the perceived usefulness of individuals adopting IT. First, what are advantages/disadvantages to adopting IT?   Second, what are obstacles from stopping IT adoption?   Third, what individuals/groups might stop the IT adoption?

The second construct is the *perceived ease of use*. Davis (1989) defines this as "the degree to which a person believes that using a particular system would be free of effort." Common questions we might ask regarding this construct are "would you be able to easily learn the system?" and "would you find the system easy to use?"

The third construct is the *subjective norm*. Fishbein and Ajzen (1975) and Venkatesh et al. (2003) define this as "the person's perception that most people who are important to him think he should or should not perform the behavior in question". A question to ask when addressing this construct is, "do people who influence you or are important to you think you should use the system?"

The individual behaviors regarding IT adoption can lead to a number of outcomes according to Riemenschneider et al. (2003). First, adopting IT can promote the product or service better. Second, adoption can improve relationships with customers and clients. Third, they can improve communication with vendors and suppliers. Fourth, they can break down geographical barriers of doing business. Fifth, they can keep pace with the competition. Sixth, they can generate new business. Seventh, they can reduce costs in other areas of the business functions. Last, they can improve the firm's image within the industry.

Table 4 in the appendix highlights the concepts discussed above, a description of the concepts, questions used in interviews with micro-enterprise owners, and the outcomes of the concept. The following section describes the methodology used to build theory grounded in the data collected through interviews and observations of how the use of ICTs or the lack thereof by micro-enterprises in the two communities.

METHODOLOGY

In this research we follow a case study approach in which three micro-enterprises are selected. Walsham and Sahay (2006) found that more action research and longitudinal studies should be conducted, and that studies should focus on the community when investigating how ICTs contribute to development. This brings us to the research question, how can the use of ICTs by micro-enterprises lead to community capital? According to the Association for Enterprise Opportunity (AEO), as of the 2008 census, micro-enterprises made up 87.95% of all businesses in the US. They say that if one in three micro-enterprises were to employ one additional employee, the US economy would achieve full employment. In the US, the net worth of an African American non-business owner is $10,000, and a Hispanic/Latino non-business owner is $9000. However, an African American business owner's net worth is $77,000 and a Hispanic/Latino business owner is $37,000. These AEO statistics show the importance of micro-enterprise development in these communities.

Communities

We chose two communities because they are located in developing areas of an already developed country (USA). Community N's median household income is 63% of the average for the rest of the city[1]. 21.8% of families live below the poverty line compared to 6.3% for the rest of the city. Education is also lower, with 26.13% of the population having less than a high school diploma, whereas the rest of the city is at 12.6%. The area also has a large concentration of African Americans (58%). Community S faces similar difficulties, is located approximately four miles from Community N, and higher developed communities are located between these two developing communities. 48% of the residents are Hispanic, and the median household income is $39,822, compared to $51,045 in the entire city. According to City-Data.com, as of 2009 the median per capita income in the surrounding metropolitan area was $26,377, while the Hispanic/Latino median per capita income was $12,308. The median household income is $39,822, compared to $51,045 in the entire city. Education is also low, as 29% of the people have no high school diploma, while in the entire city only 11% do not have a high school diploma. Only 9% has a bachelor's degree or higher, while 31% of the city has a bachelor's

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[1] All statistics from the Omaha Chamber of Commerce, unless otherwise noted.

degree or higher. These two communities are examples in which the income disparities and inequalities with the rest of the country are very high, and are representative of the challenges faced by such communities in the rest of the world. With these economic disparities and high population of African Americans and Hispanics, they provide a tremendous opportunity for development.

Criteria for Selection

The selection of businesses for this study was based on their size. We arrived at our selection criteria for micro-enterprises based on statistics provided by the AEO. According to the AEO, micro-enterprises are a form of small business having five or fewer employees, and requiring seed capital of not more than $35,000. Based on this, we formulated the following criteria for selecting businesses for this study: 1) sole proprietorships, 2) in business for a minimum of one year, and 3) five or fewer employees. The size of the businesses is important, as it is likely that smaller businesses need more support from their communities in order to survive and thrive. We chose not to use the criteria for seed capital, as this information is not easily arrived at.

Mode of Analysis

Once we collected the data, we analyzed it using open coding to arrive at labels, descriptions, and categories. Open coding is a technique used in grounded theory. Corbin and Strauss (1990) identify three steps of coding, starting with open coding, followed by axial coding, and selective coding. Urquhart et al. (2010) explains that open coding is the description stage of data analysis. Corbin and Strauss (1990) compare events/actions/interactions with other events/actions/interactions to see similarities or differences. This helps to provide labels and descriptions (categories) that will lead us into the next step of axial coding.   Corbin and Strauss (1990) describe axial coding as relating categories to their subcategories, and then we test these relationships against our data. These relationships between categories are the essence of theory building (Urquhart et al., 2010).   Through this, we create a coding paradigm of conditions, context, strategies, and consequences.

RESULTS

The researchers observe that community S and community N have an opportunity for development. We can help bring about this development while utilizing ICTs, individual, and community knowledge, giving us a broad spectrum to achieve sustainable community development.   Increasing community capital occurs from increasing ecological, social, economic, and human capital, which feeds off the effects of ICT usage. We will address this phenomenon in the following section.

This table shows the business names that we interviewed (names are anonymous, these are codes for the business names), number of employees, location, and a business description. We retrieved all information from the Reference USA database, which we have access to free of charge through the University of Nebraska at Omaha Library, and you can see them in Table 1:

Table 1: Businesses we interviewed			
Business Name (code)	Number of Employees (including owner)	Location	Business Description
CC	2	Community N	Art Dealer
CK	4	Community N	Full-Service Restaurant
SG	3	Community S	Full-Service Restaurant

During the interviews, we needed to ask the business owners a series of questions to understand their IT needs. This will allow us to provide three options. First, if we determine they are a candidate for IT interventions we will help them with this process. Second, if they are already using IT extensively and require a more complex solution, we will either consult with them directly or refer them to a local consultant. Third, if they are unwilling or unable to invest in IT, we will not intervene and will document these reasons. We prepared a series of questions but found that the answers were not straightforward, so we did not pursue these strict questions; rather we kept the interviews conversational.   We describe the businesses based on our interviews and observations in Table 2:

Business Name	Location	Number of Employees	Years of Operation	Observations	IT intervention candidate?
CC	Community N	2	29	Clean, new location with like-minded businesses. Willing to learn and implement new technology.	Yes, because they embrace technology to help their business.
CK	Community N	3	12	Dirty building, run down, low economic area. Suspicious of people they do not know. Only technology is credit card machine. Low prices.	No, because they do not see the value of investing in IT. Do not think customer base will expand beyond community.
SG	Community S	3	19	Moderately clean. Somewhat rude. Language barrier. Owner is very busy.	No, because he did not want to take the time to talk to us.

Table 2: Business Descriptions

The following subsections contain highlights and details from our interviews, including observations on community capital.

Case CC:

We know that they have a website, so they may not need help, but this interview will help determine any needs they have. The business is located in a newly renovated warehouse that holds many art-centered businesses and is very clean and modern. We asked whether they broke even last year and if they expect to this year. She answered yes to both. They have two employees including the owner. They currently use technology for their business, including laptops, printers, Outlook for email, WordPress for their website, Dropbox for sharing files, and Excel for providing estimates and invoices. Key benefits to them with utilizing IT are getting help organizing customer contacts, accounting, and invoicing. She said that they both learned some skills in college, but mostly they learned on the job or from the web. This told me that they

know that they want and need help, but are not sure where they can get help. She confirmed this when asked what hinders her from using ICT effectively. She answered, "Any new system, I would need to learn. But I think that simply knowing what tools can help my business and how to use them is the biggest hindrance."

Clearly, this business attracts a different type of clientele, and they often work with other businesses. They have utilized ICT in many ways, but often they do not plan their processes very well. They have a desire to use more technology to help their business and are willing to learn new systems and software. They also have a budget that can utilize IT for their business.

Community Capital Observations

We observed multiple times where this business shows community capital. First, their location is in a building with many similar businesses, so they have many networking and business opportunities. Second, two years ago the only employee was the business owner herself, and she has since employed one or two people, so the opportunity for jobs is evident. They also have some level of economic capital since they broke even last year and expect to this year. Lastly, they have the potential to develop human capital due to a desire to learn new systems.

Case CK:

This restaurant is located in the heart of community N.   The business was a small single use facility, similar to a small house. The exterior was shabby. The interior was dirty and run down. To the left were six to eight booths; to the right was a wall with a two-foot (high) by four-foot (wide) gap to conduct the orders. Regarding the business, we observed three employees including the owner. We found the price of food is very cheap.

Behind the counter, a young African American man grabbed a pen and pad to take our order. The owner was very nice but very dismissive of our purpose, looking at IT needs for his business. We persisted however in a conversational way. We asked if he had a computer at his business. He responded yes, but he only uses it for personal use, not business. He did not see how technology could help him. I pointed out that he has a credit card machine and he agreed that does help. I asked if he had a website or ever thought about it for expanding his customer base. He said no, and that his customers are from the neighborhood – if they have money, they

come eat there, if they do not have money, they do not come! I reiterated that he could expand his customer base by using technology such as a website or cheap advertising. This was not the first time he said this, and he said that he strongly believed that people do not come from outside the community, "that people see the news and don't want to come down here where there are shootings." We thanked him for his time and we thought it was a very pleasant, enlightening conversation.

Community Capital Observations

We came out of this with some helpful observations and lessons learned about this community and the business in general. His statement that the neighborhood contains the people that patronize his restaurant confirms he is there for his community. This shows he cares about his community, and I believe other individuals feel the same way. This also tells us there is a strong community element between businesses and customers in community N.

Case SG:

The restaurant was large and clean, serving both Mexican and Chinese food. There was a Latino woman at the cash register who did not speak very good English. We asked her if we could speak with the owner. He was clearly very busy, but we introduced ourselves. He spoke average English at best. He seemed interested to speak with us but was clearly busy and he asked if we could call him the next day. Two days later, I followed up with the business owner on the phone. When he picked up the phone, he was very rude and did not want to talk about this at all. He said he was "more busy now than I was when you stopped in, and I don't even know what you want" (even though we explained it clearly). At this point, he hung up the phone on me!

This business will not be a candidate for IT intervention, but we did learn a lot based on this meeting, combining what we learned from other interviews. Picking small businesses at random is a difficult way to find willing subjects for IT discussions. It seems their level of trust is low, even when trying to build a relationship. In community S, a slight language barrier makes this prospect even more difficult. If there is a way to know that a business is willing to discuss this, we have a better chance of getting into discussions with them. If we had an intermediary, such as a friend who knows a business owner, that could help. These owners are

clearly busy (often running the entire business themselves), so some of them simply do not have time to be good candidates.

Community Capital Observations

Due to the short nature of our interview and our observations of the building, we did not ascertain much about community capital at this business. We did observe low levels of social capital (rudeness, lack of trust), so developing community capital would need to start with this element before bringing ICT usage to their business.

ANALYSIS

Corbin and Strauss (1990) identify three steps of coding, starting with open coding, followed by axial coding, and selective coding. Urquhart et al (2010) explains that open coding is the description stage of the data analysis. Corbin and Strauss (1990) compare events/actions/interactions with other events/actions/interactions to see similarities or differences. This helps to use theoretical sensitivity by creating labels and descriptions (categories). Theoretical sensitivity helped us understand the context for developing our theory (Glaser, 1978; Urquhart et al., 2010). The open coding of our interviews shows the category along with the percentage of occurrences (in parentheses), the labels, and frequency of each label, and we show this in Table 3:

Table 3: Open Coding		
Category	Labels (open coding)	Frequency
Low Social Capital (22.9%)	Suspicion	2
	Security	1
	Rude	4
	Forgetful	1
	Low trust	2
	No Interest In Expansion	1
High Social Capital (6.2%)	Understanding customer base	1
	Provide low cost food to community	1
	Networking opportunities in community	1
Low Acceptance (10.4%)	Lack of perceived usefulness	3
	Minimal Technology Usage	2
High Acceptance (20.8%)	Hardware And Software Usage	4
	Need More Technology	2
	Need IT Consulting	2

	Website	2
Low Economic capital (2%)	Economic Need	1
High Economic capital (4.2%)	Break Even	2
Low Human Capital (4.2%)	Learning how to use software	2
Low ICT Effects (8.3%)	Lack administrative efficiencies	4
Challenge (20.8%)	Lack Time	3
	Language Barrier	2
	Rude	2
	Low trust	2
	Low attention	1
Total (100%)		48

Table 3 shows the coding based on our interviews and the following subsections explain reasons for this coding and explanations about the table.

Social Capital

Low social capital contained the most codes that we created, with eleven out of 48, or 22.9%. Some interactions the interviewee was rude, there was little trust, and since they did not know us, often they were suspicious. Interestingly, this only occurred at the low economic capital businesses. We did observe some levels of high social capital in both a low economic capital business and a higher economic capital business. The owner of CK understood his customer base both demographically and economically. In the high economic business (CC), they are in an area with other similar businesses that provide networking and customer opportunities. Overall, high social capital was low with 6.25%.

Acceptance

The concept of acceptance was difficult to gauge. Low acceptance occurred 10.4% of the time, mostly because of unwillingness to use technology at all. We found high acceptance to be a tie for the highest frequency at 20.8%, but there are some caveats to explain. We included credit card machines as accepting technology, since the owners had to adopt a technology to meet customer needs. This tells us the owner is at least willing to accept some technology, as long as they understand the need and use. We also include website in this category, which simply means the business has a running website. As we constantly compared our slices of data

(Urquhart et al., 2010), we observed high acceptance on many levels, and we must keep our expectations of accepting ICTs tempered until we have further observations or provide IT interventions.

Economic Capital

One micro-enterprise in community N was dirty and they do not maintain the premises. The neighboring buildings share the same characteristics, thus we observed that they have low economic capital. We did not ask if the business makes money. We asked two businesses if they break even and they both do, and labeled them as having high economic capital. Both low and high economic capital only combined for 6.2% of our frequency. Future observations should focus on this area.

ICT Effects

CC was the primary observation with ICT effects, since they use a website, email, and other technology. They struggle with many technology capabilities such as accounting, contact organization, and invoicing. They also said they need training in any software or hardware they use, which shows a lack of administrative efficiencies. Therefore, while they do have some ICT in place, the effects are low, and accounted for 8.3% of our observations.

Challenge

The challenges we observed also tied for highest at 20.8%. These small business owners are extremely busy (lack time), some do not speak English very well (especially community S, a Hispanic community), and they do not trust many of their customers or community. This can be a barrier, although if they increase their social capital and acceptance, these challenges can decrease.

Axial Coding

The second step in grounded theory coding techniques is axial coding. Corbin and Strauss (1990) describe this as relating categories to their subcategories, and the relationships are then tested against data. These relationships between categories are the essence of theory building (Urquhart et al., 2010). Through this, we create a coding paradigm of conditions, context, strategies, and consequences. The axial coding model that we developed is in Figure 1:

Figure 1: Axial Coding Model
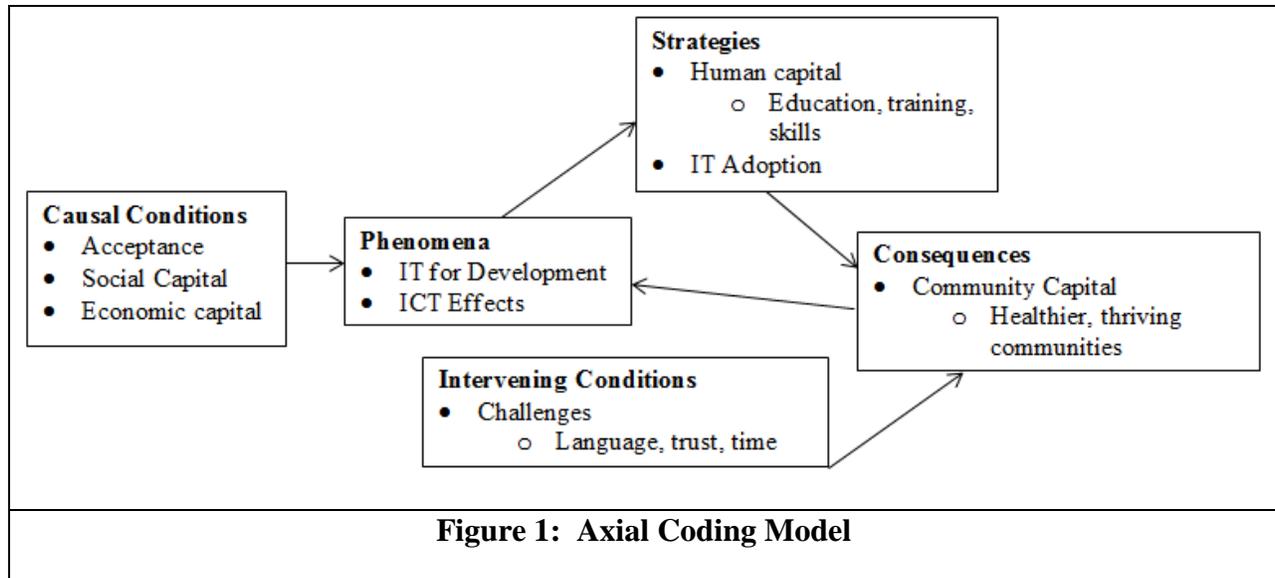
Even in a low economic situation such as CK, they needed to utilize a credit card machine, but other technology (such as a website or customer database) is not necessary to them, so they will not use their low economic capital to invest in IT. If a business lacks social capital, they lack trust, have security fears, can be rude, or do not have the desire to grow their business. If a micro-enterprise lacks economic capital, even if they choose to accept IT and have strong social capital, they will not realize the benefits of ICT and IT for development. Therefore, a *combination* of these three causal conditions is required for a micro-enterprise to embrace IT for development.   If these three causal conditions are in place, micro-enterprises also need to overcome challenges to achieve their desired outcomes (consequences). They also need to develop human capital (e.g. education, training, skills) in addition to simply adopting IT. We did not observe any ecological capital in our interviews, so we do not include it in our axial coding model.   These concepts also do not capture the individual needs for micro-enterprise development, simply because many micro-enterprises do not see a need to develop.   In the context of learning about community capital, the combination of social, ecological, human, and economic capital is relevant.

However, when looking at these components of community capital in relation to ICT usage, we see a set of related concepts that are more complex and diverse than a simple combination of concepts. In order to understand if community capital developed, we cannot simply look at the community capital components; rather we need to look at the effects the

micro-enterprise has on the community, such as creating jobs, training individuals, building a community garden, or investing in other businesses in the community.   The cycle we show in this model creates sustainability based on development of community capital, thus minimizing a lack of causal conditions and overcoming the intervening conditions.

The last step in the coding process is selective coding. This is the process by which all categories are unified around a "core" category, and categories that need further explication are filled in with descriptive detail (Corbin and Strauss, 1990). According to Urquhart et al. (2010), the characteristics of a grounded theory method are theory building, no preformulated hypotheses, joint data collection and constant comparison, and theoretical sampling. We found that while similar, development in these developing communities may share some characteristics with developing countries, but they are not the same. In these developing communities, an ICT infrastructure already is in place, but a lack of perceived usefulness, social capital, and economic capital hinders small business owners from realizing the benefits of ICTs. Developing countries do not even have this infrastructure, so even if they have some perceived usefulness, social capital, and economic capital, they may not be able to take advantage of it. This means there are opportunities in developing communities to show business owners how ICTs can help their business.

CONTRIBUTION OF THIS RESEARCH

This paper contributes to what is known about how micro-enterprises adopt ICTs to build their community capital. In doing so, they build social capital. In the process, they attain economic capital to adopt ICTs. According to Mirghani, Murray, and Mohamed (2010), ICTs need to be deployed to assist sustainability at the early stages in the development process. The theory building revealed that training business owners (and employees) who are adopting IT would help build human capital, sustain their business, and can lead to sustainable community capital. This has implications for how ICT for development efforts can be sustained through targeted technology and training interventions to support community capital.

LIMITATIONS OF THIS STUDY

There is an opportunity to take the axial coding model and perform selective coding. Further research should also address whether these results develop community capital. Although the interviews we performed gave us data for theorizing, further research could benefit from

additional case studies, observations and interviews of customers and community members who affect the livelihoods of the businesses. One other limitation is that many of the interviews we performed could not be used because the business did not fall within our criteria for selection. Often the business contained more than five employees or was in business for less than one year. Future researchers should work with community leaders to identify businesses that fit the criteria and are willing to discuss ICT usage with researchers. Lastly, future research should use a grounded theory analysis to ascertain factors that lead to achieving sustainable development from the community perspective.

CONCLUSION

This research has investigated a well-known yet understudied aspect of development, how the use of ICTs by micro-enterprises leads to community capital. This is an important problem since income inequalities within developed regions leads to increased poverty.   A gap in the literature that has been addressed by this study is the intersection of two development trends: the growth of micro-enterprises through their adoption of ICTs and how this facilitates the achievement of an underserved region's development strategies.   In these developing communities, varying levels of IT acceptance exists. Higher developed micro-enterprises often accept ICTs, have social capital and economic capital to take advantage of these conditions, but may lack the strategies to contribute to community development. In lower developed micro-enterprises, they often lack these causal conditions and cannot begin to realize the conditions that can lead to higher community capital. Our grounded theory analysis enabled in depth data to be collected and coded using open and axial coding to build a causal model of community capital. Using community capital as the core concept for this study, this research has been able to show how sustainable development efforts can be achieved by supporting the adoption of ICTs in micro-enterprises, although further research must be executed to test these theories.

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APPENDIX I:

Table 4: Instrument			
Concepts/Constructs	Description (variables)	Questions	Outcome
IT Adoption: Individual Acceptance	Perceived usefulness: "The degree to which a person believes that using a particular system would enhance his or her job performance." (Davis 1989, p. 320; Venkatesh et al.,	1. What are advantages/disadvantages to adopting IT? 2. What are obstacles from stopping IT adoption? 3. What individuals/groups might stop the IT adoption? (Riemenschneider et al.,	Promote our product or service better. Improve relationships with customers/clients. Improve communication with vendors/suppliers. Break down geographical barriers

	2003, p. 428).	2003, p. 274).	of doing business. Keep pace with the competition. Generate new business. Reduce costs in other areas of the business functions. Improve firm's image within the industry. (Riemenschneider et al., 2003, p. 275).
	Perceived ease of use. "The degree to which a person believes that using a particular system would be free of effort." (Davis, 1989, p. 320).	Would you be able to easily learn the system? Would you find the system easy to use?	Above.
	Subjective norm. "The person's perception that most people who are important to him think he should or should not perform the behavior in question" (Fishbein and Ajzen, 1975, p. 302; Venkatesh et al., 2003, p. 428).	Do people who influence you or are important to you think you should use the system?	Above.
ICT Effects	"When social and economic development activities are able to benefit from ICT implementations, the ICT effects are better access to information and expertise, increased competitiveness and access to new markets including global markets,	How can you use ICTs to enhance development?	IT can accelerate both social and economic development (Duncombe & Heeks, 2002; Qureshi, 2005; Song & Qureshi 2011; World Bank, 2003). Increased efficiencies of production, enhanced market reach, improved delivery of

	administrative efficiencies from low transaction costs, increase in labor productivity through learning and poverty reduction." (Qureshi, 2005, p. 506).		government services, and increased access to goods and services (Song & Qureshi, 2011, p. 5; World Bank, 2003).
Economic Capital	Increase in income, job creation, and clientele (Qureshi). The use of economic capital is the means to attain human and social goals (Hancock, 2001, p. 276).	Did you break even last year? Do you think you will this year?	Administrative efficiencies, new markets, new clients. Micro-enterprise growth. (Qureshi, 2005, p. 506). Increase in human and social capital (Hancock, 2001, p. 276).
Ecological Capital	"The results of reducing the environmental impact of energy use" (Hancock, 2001, p. 278).	Do you turn off lights and computers when not in use? Do you know of community gardens or other resource sharing in the community?	Conservation of resources, reduce environmental impact. Increase in human capital (Hancock, 2001, p. 278).
Social Capital "A variety of different entities, which consist of some aspect of social structures, and they facilitate certain actions of actors within a structure" (Coleman 1988, p. 98). "The 'glue' that holds our communities together" Hancock, 2001, p. 276).	Obligations and expectations. Depends on two elements: trustworthiness of the social environment and the actual extent of obligations held (Coleman, 1988, p. 102).	Do you trust your neighboring business and individuals?	The creation of human capital. Education increases. Economic development increases. Community relations improve. (Coleman 1988, p. 108). Increase in human capital. (Hancock 2001, p. 276).
	Information channels. Social relations that constitute a form of social capital that	Do you communicate with others in the community?	Above

	provides information that facilitates action (Coleman, 1988, p. 104).		
	Social norms. "One should forgo self-interest and act in the interests of the collectivity" (Coleman, 1988, p. 104).	Do you desire improving the community interests?	Above
Human Capital	"Human qualities that can be employed as 'capital' in production" (Sen 1999, p 292). "Consists of healthy, well educated, skilled, innovative, and creative people who are engaged in their communities and participate in governance" (Hancock, 2001, p. 276).	What can you do to increase your capability as a person (human)? Would you be willing to use education to increase your human capital?	People become more efficient in commodity production. Increases human capability. Adds to the value of production and to the income of the person. (Sen 1999, pp. 292-293).
Community Capital	"The combination of social, ecological, human, and economic capital" (Hancock, 2001, p. 279).	Do you invest in community projects? Have you created any new jobs?	Healthier, thriving communities (Hancock, 2001, p. 279).