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# Understanding the Role of Information Technology for Sustainable Development in Small Businesses and Micro-Enterprises

By

Jie Xiong

A DISSERTATION

Presented to the Faculty of

The Graduate College at the University of Nebraska

In Partial Fulfillment of Requirements

For the Degree of Doctor of Philosophy

Major: Information Technology

Under the Supervision of Dr. Sajda Qureshi

Omaha, Nebraska

July, 2016

## Supervisory Committee

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# UNDERSTANDING THE ROLE OF INFORMATION TECHNOLOGY FOR SUSTAINABLE DEVELOPMENT IN SMALL BUSINESSES AND MICRO-ENTERPRISES

Jie Xiong, Ph.D.

University of Nebraska, 2016

Advisor: Dr. Sajda Qureshi

Small businesses, including micro-enterprises, represent the majority of all firms in the world. This study investigates how Information and Communications Technologies (ICTs) can impact the performance of small businesses, including micro-enterprises. This research introduces an updated Information Technology for Development (IT4D) framework to investigate the key factors that influence the adoption of technology in small businesses. Through structural equation modeling (SEM) and factor analysis of 118 micro-enterprises in China, facilitating conditions, attitude toward using technology, and anxiety is positively related to the behavior intention to use IT. Also, the usage of ICTs and human capital have a positive effect towards the development of small businesses. In order to understand why, in-depth case analysis of China and the United States based micro-enterprises was carried out using a qualitative research strategy. Case study data was gathered from 11 Chinese, Native American, African American, and Caucasian owned micro-enterprises and small businesses in the United States and China. In order to find out how the growth of those micro-enterprises varies, a comparative analysis was carried out. The results suggest that the characteristics of ICTs, the access to ICTs, and personal inequalities impact the process of economic development and empowerment of the small businesses.

Contributions of the dissertation are as follows: the theoretical contribution of this dissertation is an updated framework for IT4D. The practical contribution is in the interventions that providing IT training opportunities are critical for the growth of small businesses. Finally, this research identifies gaps in the IT4D in small businesses and proposes a framework to guide future research.

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## **CHAPTER 1: OVERVIEW AND INTRODUCTION**

Small and Medium-Sized Enterprises (SMEs) have attracted research interest since early 1980s from researchers in management (Carland et al., 1984; Yap et al., 1992), finance (Petersen & Rajan, 1994), economics and statistics (Bates, 1990), marketing (Moen & Servais, 2002), organization studies (Paniccia, 1998), information systems (IS) (DeLone, 1988), and many other research domains (Cooper, 1981; Yap et al., 1992; Strahan & Weston, 1998). IS researchers are particularly interested in the Information Technology (IT) artifacts embedded within organizations, applications, technologies, and people (Zhang et al., 2011). Those IT artifacts embedded within organizations are widely studied by IS researchers. However, while the social-economic development and transformation relies on new technological infrastructures and organizational changes, there is still a weak link between organization studies and Information Technology (Orlikowski & Barley, 2001). As a reference discipline, studies in the IS fields are often relied upon to assist growth and development; although SMEs, particularly small businesses, often find technology difficult to implement because of resource constraints (Street & Meister, 2004; Raymond, 1985). Therefore, from the IS perspective, it is critical to understand the role of IT artifacts in SMEs and whether the use of IT could lead to the development of SMEs or not.

Even though many large companies started as small businesses or SMEs, very little is known about on how changes and transformations are conducted internally within the SMEs. More than 20 years ago, DeLone (1988) pointed out that IT planning as well as the IT knowledge of SMEs' executives are associated with the success for computer usage in small businesses. More recently, Street and Meister (2004) performed action research on

small businesses and they discovered a tighter connection among the employees within the organizations. They discovered that internal transparency was critical for the growth of small business. While SMEs can be a seedbed for industrialization by either graduating to larger companies or accumulating capital that might be invested later (Grosh & Somolekaem, 1996), other factors, including the use of Information and Communications Technologies (ICTs), can largely influence the outcome of the development. Walsham and Sahay (2006) identified several challenges that need to be addressed by both researchers and practitioners who conducted IS research in developing countries. They are 1) How can ICTs promote “development”? 2) What is the “development” to which ICTs aim to contribute? 3) What are the key issues being studied related to ICTs? 4) What is the theoretical and methodological stance? and 5) What level and focus of analysis is being adopted? Understanding and analyzing those challenges in SMEs is critical for future research.

While there is dramatic shift and advances in the usage of ICTs during the past decade, ICTs have been applied to conceptual theoretical understanding of development and empirical contributions (Qureshi, 2015). Geoff Walsham (2012) argued that IS community should explore how ICTs could help improve individual capabilities and opportunities in order to make a better world (Walsham, 2012). It is argued by Qureshi (2015) that if the concept of development can be applied towards research and contributions that lead to improvements of people’s life, then at some level, we are making a better world with ICTs. Walsham (2012) offered a unifying vision of the IS field by conducting more interdisciplinary research. Even Information and Communications Technology (ICT) has been conceptualized as a tool to achieve social, economic, and



human development, little is known about how this tool actually may or may not enable development (Xiong & Qureshi, 2015).

Research in the field of Information Technology for Development (IT4D/ICT4D) has grown to provide specific insights and approaches through which IS can be implemented and adopted in a variety of cultural contexts. It is the research of how innovative applications of Information Technology brings about improvements in the lives of people. These are assessed in terms of economic, social, and human outcomes. Walsham (2012) further argued that there was a need for “strong ethical agenda” in order for ICT4D to make a better world. He suggests that both IS researchers and practitioners should emphasize on how the use of ICTs could potentially provide opportunities and capabilities to use technologies to make better lives for individuals, the communities, and the world (Walsham, 2012).

However, Qureshi (2015) argues that the ICT4D research fails the poor because 1) there are very few researchers that focus on advancing policy positions rather than quantitative studies, which is less accessible to the public, 2) ICT4D researchers don't engage closely with users of the research, and 3) ICT4D research is perished by citations and impact factors. Qureshi (2015) proposes a typology for ICT4D research to investigate the role of ICTs in making a better world. Based on different levels of analysis, from individuals to organizations, from countries to regions, different unit of analysis, different types of ICT uses, and various development outcomes should be investigated. As ICT is used by many small business owners to improve their performance, productivity, and competitiveness in the marketplace (UNCTAD, 2011), it is important to understand how ICTs can support the growth and maintain the sustainable development of these small

businesses (Qureshi & Lamsam, 2008; Chen, Parker, & Lin, 2006; Garsombke & Garsombke, 2000; Varma, 2005).

While the general IS research can be well observed from the diffusion and the socially embedded discourses (Avgerou, 2008), both developed and emerging countries like the United States and China are attempting to benefit from the usage and adoption of ICTs. However, the use of ICT is a challenge (Wolcott et al., 2008; Schreiner & Woller, 2003). While the definition varies between countries and industries, a small business is a business that is privately owned and operated with a small number of employees and relatively low volume of sales (Chapter 2 provides detailed information about the definition of SMEs). In the United States, a small business is generally defined as having fewer than 500 employees with less than \$7 million in average annual receipts (Summary, 2011). In contrast, China defines a small business as one with employees ranging from 10 to 100 (The Standard, 2011). In the United States, small businesses currently represent 99.7 percent of all businesses. They have generated nearly 64 percent of all new jobs in the country over the past 17 years while creating more than half of the nonfarm private Gross Domestic Product (GDP) (USSBA, 2011; Kobe, 2007; CHI Research, 2003). China's economic performance over the past 30 years has been remarkable due to the development of the SMEs. In China, small businesses represent 99 percent of all businesses, and they generate 75 percent of all new jobs in the country (Small Business, 2011). Small businesses are critical to economic development in China and have been for a long time (Yu et al., 2001). Their survival and growth contributes to the creation of jobs and wealth in the economy. If small businesses are able to use information systems effectively, they can grow from the added benefits that technology provides, and become quite profitable (Qureshi &

York, 2008). Small businesses play an important role in all countries. The use of ICT will provide new opportunities for small businesses in both developed countries and emerging countries.

The process of information technology adoption and use is then critical to derive the benefits of Information Technology (Karahanna et al., 1999). While the use of ICT continues to grow worldwide (United Nations, 2010), in the Asia-Pacific region, China hosts the fastest-growing ICT markets. On the other hand, the long period of rapid development of the United States economy over the past 10 years coincides with significant investment and the diffusion of ICTs and their applications (Schreyer, 2000). It appears that when businesses adopt ICTs in their business process, their ability to grow increases. Thus, this research will investigate the growth of the small businesses using theoretical frameworks from IT for Development, in particular, human capital, and empowerment, to understand how ICT/IT affects the small businesses.

Preliminary results from previous research has shown that IT adoption is an important determinant of how ICT can bring about development in micro-enterprises. In a study by Xiong and Qureshi (2012) of small businesses from China and the United States, perceived usefulness, cost of technology, and licensing fees enables IT adoption in small business and its sustainability. Existing research also points out those intervening conditions of human capital such as the education and IT skills of employees that effect economic and social development. Information systems are often relied on to assist growth and development, although small businesses often find technology difficult to implement because of resource constraints (Street & Meister, 2004; Raymond, 1985). Kamal and Qureshi (2009) explored 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. These trends are: the growing role of SMEs and the advancement of ICT (Duncombe & Heeks, 2002). The research found that poor rural entrepreneurs relied heavily on informal, social, and local information systems. The ICTs might play a supplementary role. However, little attention has been paid towards the research of the relationship between ICT and the development of small businesses, especially on the individual-level (Walsham & Sahay, 2006). This dissertation contributes to the intersection of these trends by investigating the outcome of ICT adoption.

A majority of research on IT4D focuses on developing countries (Avgerou, 2008), digital divide (Thompson, 2004), and ICTs' contributions towards development (Kleine, 2015). As IS researchers, we have taken for granted many IS key concepts such as 'Information', 'Theory', 'System', and 'Organization' (Lee, 2010). Indeed, it also includes "development", "SMEs", "ICTs", and "IT4D". There is a sense that development takes place in all countries of the world regardless of their levels of development. Despite the previous research that focuses on how ICTs may or may not lead to the development in both developed and developing countries and regions (Schreiner & Woller, 2003; Duncombe & Heeks, 2002; Street & Meister, 2004; Raymond, 1985; Riemenschneider et al., 2003; Morales & Qureshi, 2010), and various definitions of development, it is still unclear what extent IS publications consider the research in IT4D on SMEs, and how ICTs may or may not lead to the development. Furthermore, do ICTs really matter for the

development of SMEs (Qureshi, 2011)? As more and more SMEs are born every day, it is important to understand what the perspectives are formed from recent publications.

In sum, this dissertation focuses on the comparative analysis of IT adoption for small businesses, including micro-enterprises between different groups of owners in the United States and China. Several research questions will be crafted to investigate these gaps in the literature.

### **Research Questions**

In order to bridge the practical and theoretical gaps, a set of research questions are proposed below. The overall research questions being investigated for this dissertation are:

*RQ 1. How do IS researchers approach and conceptualize the IT4D research on SMEs?*

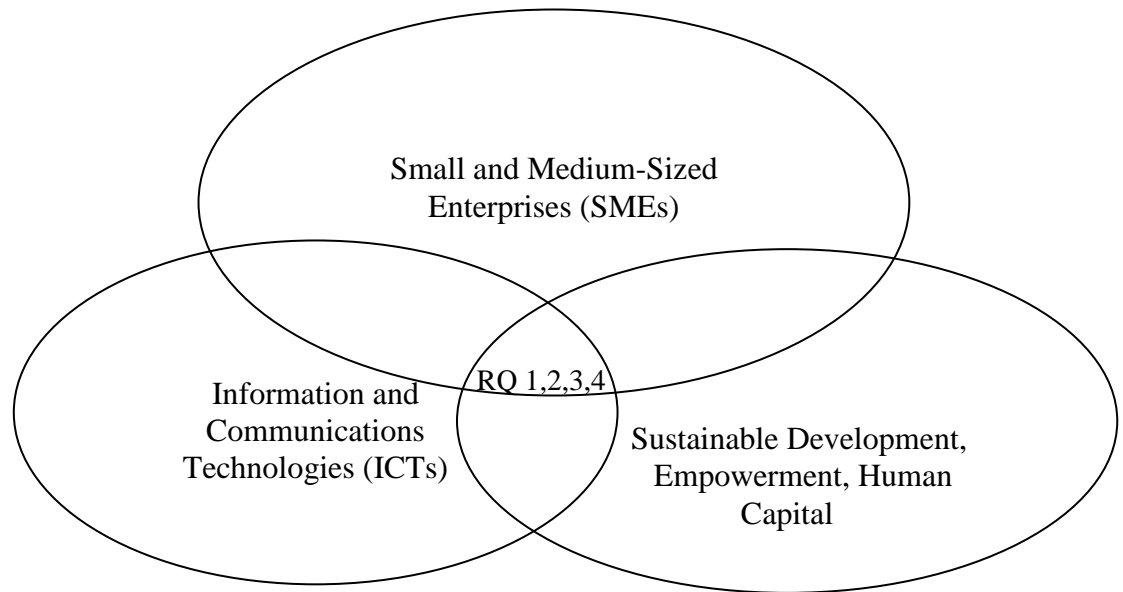
*RQ 2. What are the key factors that influence the adoption of technology for the small businesses, including micro-enterprises?*

*RQ 3. What aspects of digital divide are preventing small businesses from sustaining themselves between different ethnic groups?*

*RQ 4. How can ICTs support the development of small businesses?*

Those research questions will be analyzed and answered throughout the dissertation.

These research questions are informed by the following theoretical lenses.



**Figure 1. Theoretical Lenses and Positions of Research Questions**

The first research question will be analyzed and answered throughout the theoretical lenses from SMEs, ICTs, and sustainable development. By proposing and identifying the conceptualization of IS researchers' approach toward the IT4D research on SMEs, two open questions are presented to guide future research questions.

The second research question continues the discussion by offering a comparative analysis between the small businesses, including micro-enterprises in the United States and China. The key factors that affect ICT adoption by small businesses in China will be uncovered and the results will be compared with the results from data collected in the United States. This addresses the gap in the literature requiring research between the relationship between ICT and the development of small businesses.

The third research question further identifies the factors that could potentially hinder the development of small businesses and micro-enterprises within the digital divide

content. Several factors, including the characteristics of ICTs and the access to ICTs, which are studied in the second research question, and personal inequalities, will be identified to impact the process of economic development and empowerment.

The final research question provides implications and recommendations for both practitioners and academics to further advance and support the development of small businesses in the United States and China. Small businesses owned by Native Americans, African Americans, and Chinese Americans in the United States and Chinese in China will be compared and analyzed toward different levels of development. Factors that may contribute to those changes and different levels of development will be identified.

### **Chapters in the Dissertation**

There are 8 chapters in the dissertation. Chapter 1 provides general information of the research domain and definition of research questions. Chapter 2 provides theoretical background to support the research. Chapter 3 provides literature review and gaps from the literature to guide future research. Chapter 4 provides a comprehensive overview of the research methodology chosen to further explore the research questions. Chapter 5 reports the case study collection process and results. Chapter 6 and Chapter 7 report the comparative case analysis and cross data analysis. Chapter 8 finalizes the data and analysis. It also summarizes the dissertation with conclusion, contribution, discussion, and limitation. Table 1 provides an overview of chapters in the dissertation.

**Table 1. Overview of Chapters in the Dissertation**

<b>Chapter</b>	<b>Name</b>	<b>Description</b>
1	Overview and Introduction	Provides general information of the problem domain and definition of research question.
2	Theoretical Background	Provides the theoretical background to further support future research.
3	Literature Review	Provides literature review, gaps from the literature, and ways forward.
4	Research Model and Methodology	Provides overview of research methodology that are chosen to further explore the research question.
5	Case Studies	Reports the case data collection that was conducted from 2011 to 2015.
6	Comparative Case Analysis	Reports the comparative case data analysis.
7	Cross Data Analysis and Results	Reports cross data analysis and results.
8	Conclusion, Contribution, Discussion, and Limitation	Summarizes the dissertation with contribution, limitation, and discussion.

The research schedule and different research stages are provided in the Tables 2 and 3 below. Detailed information can be found in Chapter 4.

**Table 2 . Research Activity Timeframe**

<b>Time</b>	<b>Activity</b>
2011 Fall	IRB approval; Literature Review; Pilot Case Study.
2012 Spring, Summer, Fall	Instrument Development; Stage 1-TOE and TAM integrative research model; Pilot Survey Data Collection.
2013 Spring, Summer, Fall	Stage 2-UTAUT Integrative Model.
2014 Spring, Summer, Fall	Literature Review; Stage 3-Framing Analysis.
2015 Spring, Summer, Fall	Literature Review; Proposal Defense; Final Data Analysis.
2016 Spring, Summer	Write-up; Data Analysis; Finalization.



**Table 3. Stages of the Research**

Time	Stages	Methods of Reasoning	Research Methodology	Data Sources	Theory Applied
2011-2012	1	Deductive	Case Study (Qualitative)	N/A	TOE/ Technology Spillovers
2011-2012	1	Deductive	Case Study (Qualitative)	Interview	TOE/TAM
2012-2013	1	Inductive	Case Study (Qualitative)	Interview	Social Embeddedness
2012-2013	2	Deductive	Questionnaires and Survey (Quantitative)	Survey	UTAUT
2012-2013	2	Deductive	Questionnaires and Survey (Quantitative)	Survey	UTAUT, Human Capital
2013-2014	2	Inductive	Cluster Analysis (Quantitative)	Literature Review	Economic/Social/Human Development
2013-2014	3	Inductive	Case Study (Qualitative)	Interview	Empowerment
2014-2015	3	Deductive	Case Study (Qualitative)	Interview	Digital Divide
2014-2015	3	Deductive	Framing Analysis (Qualitative)	Interview	Economic Development Outcomes, Empowerment
2014-2015	4	Inductive	Qualitative and Quantitative	All Above	All Above

The overall research project is approved by the Institutional Review Board (IRB) with IRB #: 180-12-EX under the name of 1) *Cross Country and State Level Analysis of e-Commerce Adoption between Small Businesses in China and the United States* (Approved in 2012), 2) *Analysis of IT Adoption in Small Business in the United States and China: Adoption Decision, Human Capital, and Sustainable Development* (Approved in 2013), and 3) *Information and Communications Technology Development for Native American Small Businesses and Microenterprises with a community Emphasis* (Approved in 2014). Appendix D provides detailed information with IRB approval letters.

## **CHAPTER 2: THEORETICAL BACKGROUND**

This chapter addresses the first research question, which is *How do IS researchers approach and conceptualize the IT4D research on SMEs?* Firstly, literature review on Information Technology for Development is conducted. Then, IS Scholars' focus on "For Development" versus "In Developing Countries" is provided. Finally, literature review on SMEs and IT adoption is conducted.

### **Information Technology for Development**

Information Technology for Development (ITD/IT4D) research has made various contributions in providing equitable access to information, knowledge, and welfare in areas such as education (Rodrigues & Govinda, 2003; Rodrigo, 2003; Scheepers & de Villiers, 2000), healthcare (Braa, Monteiro, & Sahay, 2004; Mosse & Sahay, 2005; Kimaro & Nhampossa, 2005), software development (Chudnovsky & Lopez, 2005; Tan & Leewongcharoen, 2005; Han, 2000), reduction in poverty (Cecchini & Scott, 2003; Kenny, 2000; Qureshi, Kamal, & Wolcott, 2009), better government (Tan & Leewongcharoen, 2005; Walsham & Sahay, 1999; Qureshi, 1998), and off-shore outsourcing (Sahay, Nicholson, & Krishna, 2003; Preis-Heje, Baskerville, & Hansen, 2005; Hawk & McHenry, 2005). As Street and Meister (2004) pointed out, the Information Systems is a solution to address the small businesses' IT needs to main sustainable development. In their research, action research was selected to study a Canadian manufacturing company. Harrison, Mykytyn, and Riemenschneider (1997) applied the Theory of Planned Behavior (TPB) to explain the executives' decisions from 162 small businesses. They identified that attitude, subjective norm, and perceived control are key factors to IT adoption. Sadowski, Maitland, and van Dongen (2001) investigated the adoption of Internet software and services in 264

Dutch SMEs and found the SMEs have very unique characteristics that are different from big enterprises.

The concept of *development* has its root in innovation of the firm. Development can be defined as “changes in the system that arise from within the system” (Schumpeter, 1934, p.63). Development is often used to describe growth in organizations and in the regions in which they reside. ICTs and development can be often viewed as socioeconomic improvements through transfer and diffusion (Avgerou, 2010). Economic development can entail political, opportunity, and economic freedom (Sen, 1999). As ICT development entails increasing diversity of research topics, research methods, and research implications, literature review in the information system research areas is conducted to understand the role of ICT as an artifact in development (Sein & Harindranath, 2004; Orlikowski & Iacono, 2001). This research tends to derive a common body of knowledge that can be shared in the IS area (Hirschheim & Klein, 2012).

The process of creative destruction by Tripsas (1997) and Schumpeter (1934) suggested that entrepreneurs drive capitalism with innovations. These innovations, when implemented challenge the status quo and upset the equilibrium. Warschauer (2004) stated that the greatest gains to development are not from the adoption of ICT in itself, but from the innovative ways in which technology has been adopted. According to Schumpeter (1942), it is the innovations that enable businesses to survive business cycles that would otherwise destroy them. He suggested that innovation is the implementation of a new change that affects and alters a market. Innovations are not just inventions but can be new processes or new markets. Schumpeter suggests that the entrepreneur is the agent of

innovation whose adoption of the innovations will enable the business to survive and potentially grow.

Traditionally, IS research has been driven by areas such as adoption and diffusion of IT (Davis, 1989; Harrison et al., 1997; Venkatesh et al., 2003; Gefen et al., 2003) for developing methods and approaches for implementing IS globally and for managing dispersed collaborative environments in a variety of contexts including off-shore outsourcing (Carmel & Nicholson, 1993; Tractinsky & Jarvenpaa, 1995; Willcocks et al., 2004; Sahay et al., 2003; La Rovere & Pereira, 2000; Watson & Gray, 1997). However, since IS research is both a science and a profession, generalizability is still a major concern in IS research (Lee & Baskerville, 2003).

Similarly, research in the field of Information Technology for Development has grown to provide specific insights and approaches through which IS can be implemented and adopted in a variety of cultural contexts. It is the study of how innovative applications of IT bring about improvements in the lives of people. These improvements are assessed in terms of economic, social, and human outcomes. The following sections describe what is known about the three aspects of development: economic, social, and human. Table 4 provides different Perspectives on Development.

**Table 4. Perspectives on Development**

Sources	Definitions
Sen (2001)	Freedom is the main object of development, including political freedoms, freedom of opportunity, and economic protection from abject poverty.
Schumpeter (1934)	Economic development consists from innovations.
Barder (2012)	Development is an emergent property of an economic, social, and political system.
Summer and Tribe (2008)	Development is a long term process of structural social transformation. Development is a short-to-medium term outcome of desirable targets. Development is a dominant discourse of western modernity.
Willis (2011)	Development as an economic process. Development as “modernity”. Development is a highly-contested concept.
Sachs (1999); Greig et al. (2007)	Development is economic growth
Habermas & Ben-Habib (1981)	Development is the diffusion of modernity.
United Nations Human Development Index (HDI)	Human Development consists of a long and healthy life, being knowledgeable and have a decent standard of living.
World Bank (2015)	Development is improvement of life quality: access to education, healthcare, employment opportunities, and so on.

### **Economic Development**

The most discussed aspect of development, which is economic development, can be viewed as quantitative and qualitative improvement in the economy. Economic development as a concept entails a broad view of economic growth. Malecki (1997) distinguished between economic growth and economic development. Economic growth (Malecki, 1997, p1) and economic development “leads to qualitative improvements in life” (Malecki, 1997, p1). As Sen (1973, p748) pointed out, “economic growth is one aspect of the process of economic development.” Economic development involves the growth and improvement of factors such as literacy rates, poverty rates, employment rates, GDP per capita, access to healthcare, and government investment.

On the other hand, care must be taken to understand ICT investment and strategies in developing countries. Ewusi-Mensah (2012) provided analysis associated with IT diffusion in sub-Saharan Africa. He identified inadequate IT resources, hindered levels of IT assimilation, and the inadequate human resources as the main reasons the impact of IT on the economy is problematic. Essentially, as a country level indicator, economic development is highly related to human development in education, health, and income. Economic growth and development are often observed simultaneously. For example, Kamal et al. (2008) investigated ICT capacity and skills, and their effect on economic development in 183 countries of the United Nations. The authors showed that increase in skill development and ICT capacity development would ultimately lead to economic development. Jiménez et al. (2013) researched the Cobb-Douglas relationship, between GDP per capita, info-density, tertiary and secondary education, and labor from 72 countries. They pointed out that there is an imbalance between developed and developing countries in the ICTs' effect on GDP per capita.

As a key determinant of a nation's development of production, technology can be explained as an exogenous factor which could interact with other determinants, such as capital and labor, and lead to economic growth (Mankiw, 2012). Mankiw et al. (1992) provided an augmented Solow Growth Model and analyzed the data of 121 countries from 1960-1985. It was observed that there are not substantial externalities to the accumulation of physical capital, which provides the foundation for emerging economies in the world, such as Brazil, Russia, India, and China (BRIC) to catch up and to achieve "leapfrogging" (Brezis et al., 1993). That is, new technology enables developing countries to use lower wages to achieve new leadership (Brezis, 1993; Lee & Lim, 2001; Steinmueller, 2001).

Samoilenko and Osei-Bryson (2011) applied the Solow growth model to show that IT can have an effect on productivity in certain types of countries under certain conditions. Disparities occur in all societies, including those considered to be developed. Chakraborty and Bosman (2005) measured the inequalities in home PC ownership in the United States by applying the Lorenz Curve and the Gini coefficient. Based on data gathered in 2011, authors suggested that inequalities in PC ownership are substantially smaller among white households than among African American households in the United States. It is important to bridge those gaps because the use of IT appears in both developed and developing areas. There are several international organizations, for example, International Telecommunication Union (ITU), United Nations Conference on Trade and Development (UNCTAD), The United Nations Educational, Scientific and Cultural Organization (UNESCO) Institute for Statistics (UIS), Organization for Economic Cooperation and Development (OECD), UN Department of Economic and Social Affairs (UNDESA), and World Bank, focused on the measurement of and access to ICT infrastructure. The core indicators for measuring access to ICT are radio, telephone, television, and computer (ITU, 2014).

The outcomes from ICT4D can be assessed in a number of ways. The measures of economic development most often used to assess small businesses are: increase in income, job creation, and clientele (Qureshi et al., 2009). In their model, authors use bidirectional arrows because the growth and development of the businesses can bring about greater IT adoption, leading to more technology being purchased and an improvement in the organization and its environment.

## **Social Development**

Social development is governed by many factors such as capital, technology, and government support. Social development tends to focus on “putting the people first” in the development process (World Bank, 2014). Warschauer (2004) introduced the idea of interaction between ICT and social inclusion. Social relations shape access to ICT, as well as human and social development (Coleman, 1988). The concept of social capital was also introduced, which is defined as “aspect of social structures, and the facilitation certain actions of actors within the structure” (Coleman, 1988, p.98). The benefit of ICT can be shared through social development, which will increase social capital.

Midgley et al. (1986) pointed out the importance of community participation in social development. Although those changes, especially from the Internet (Castells, 2001) will provide challenges, opportunities, and risks for emerging areas (Mansell & Wehn, 1998; Morales-Gomez & Melesse, 1998), it is important to understand how those changes could lead to sustainable development (Credé & Mansell, 1998). Byrne and Sahay (2007) conducted a participatory design for social development in South Africa. They showed that community plays a crucial role in social development. On the other hand, it is important to understand the issue of cost and wealth distribution, access, ownership and control, and culture when ICT contributes to social development (Morales-Gomez & Melesse, 1998).

Government has an effect on social development. E-government, defined as the employment of the Internet and the World-Wide-Web for delivering government information and services to the citizens, e-learning, the application in education, and e-Health, healthcare practice using the Internet (United Nations, 2006), play a critical role



which could lead to social development, especially for marginalized people in developing countries (Unwin, 2009).

### **Human Development**

The idea of human development began as a revolution of its own in the 1950s and early 1960s with the research of Schultz (1961), Mincer (1958), and Becker and Chiswick (1966). Economists place much greater emphasis than in the past on the importance of knowledge and information to development of countries and individuals (Becker & Woessmann, 2011). Human Capital has a role in lowering economic costs or in elevating customers' willingness to pay (Porter, 1985, p. 394). Human capital is defined and created by changes in individuals which increase skills and capabilities, enabling people to behave in new ways (Coleman, 1988). Human capital also can be described as all the competencies and commitments of the people within an organization (Ceridian, 2007).

In sum, economic development, social development, and human development are not independent systems. Although human development is closely associated with social development and economic development, economic development outcomes are also associated with them. This relationship can be cyclical in some cases, bringing negative growth cycles as well as positive growth cycles (Qureshi, 2005; Qureshi et al., 2009).

### **IS Scholars' Focus on "For Development" versus "In Developing Countries"**

Even though ICT has been conceptualized as a tool to achieve social, economic, and human development, little is known about how this tool actually may or may not enable development. Brown and Grant (2010) argued that the existing research in IT4D can be categorized into "For Development" and "In Developing" countries by reviewing 184

articles appeared from four dedicated ICT and development journal from 1982-2007. It is recognized that ICT for Development research focuses on the link between ICTs and development, and empowering marginalized populations, while the research of ICT in development focuses on the culture implications and local adaptation (Brown & Grant, 2010). It is argued that increased research attention should be placed on the research in developing contexts, i.e. "For Development". Avgerou (2008) suggested that the IS research in development should engage with the study of IS innovation with particular social-economic rationale, especially in the developing countries. Sein and Harindranath (2004) also proposed that ICT use, ICT views, and ICT impact as key ICT artifacts to understand the role of ICT in the national development.

Some researchers suggested that in a set of emerging economies, IT investments achieved consistently higher growth rates of GDP and productivity (Kraemer & Dedrick, 1994; Samoilenko & Osei-Bryson, 2011). Yet, Bollou and Ngwenyama (2008) investigated the total factor productivity of the ICT sectors in six West African countries from 1995 to 2002. It appears that the total factor productivity of those countries did not benefit from the investment, as "using ICT as an engine of economic growth is complex" (Bollou & Ngwenyama, 2008, p303). Heeks (2002) pointed out that the accessibility of the Information System failure in developing countries is not so easy to identify compared to the industrialized countries. Pick and Azari (2008) conducted research on the influence factors on ICT from 71 developing and developed countries. They identified technology attributes that are strongly associated with the foreign direct investment (FDI), government prioritization of IT, and the education. Authors suggested that there is a lack of case study

research from developing countries about how ICT could enable the economic, social, and human development.

While the definition of development remains controversial, majority of definitions of development carry implicit value assumptions and imply responses (Summer & Tribe, 2008). Willis (2011) placed the development theories in a historical context. Escobar (1995) discussed the alternative visions for a post-development era, suggesting that current views on development prevent people in developing countries from coming out of poverty. The various applications of ICT have been seen to fuel globalization. A number of theories have been developed on the nature and impact of the process of globalization (Castells, 2001; Held et al., 1999; Hirst & Thompson, 1996; Robertson, 1992; Scholte, 1993; Wallerstein, 1974; Giddens, 2003). Castells (2001) is notable in his description of globalization to be fueled by Information Technology in what characterizes this current technological revolution is the application of this knowledge and information to knowledge generating and information processing devices.

### **Technology, Organization, and Environment (TOE) Framework**

The technology, organization, and environment (TOE) framework contains three aspects of context that infers the process by adopting and implementing a technological innovation: technological context, organizational context, and environment context (Xu et al., 2004).

Technology in this research is seen to be appropriate technology in this model. It is defined as the “The acquisition of technology appropriate for the small businesses’ economic environment” (Schumacher, 1989). While an organization is normally defined in the dictionary as “a social group which distributes tasks for a collective goal”, this

dissertation considers the small business as the main unit of analysis. According to the Small Business Administration (SBA), a Small Business is independently owned and operated and not dominant in its field of operation. More specifically, we define each small business in the research as one organization of up to 100 employees, which has certain communication processes and structures. This means that different organizations could have different sizes, different communication processes, and business structures. Defined by Tornatzky and Fleischer (1990), environment is “the arena in which an organization conducts its business”.

### **Information Technology Adoption**

In order to research the adoption of ICT for small businesses in the United States and China, and examine how these relationships vary across different environments, there are some models of information technology adoption and acceptance and information technology for development that this research draws upon. There are several existing models illustrating information technology adoption and acceptance. Venkatesh et al. (2003) identified these models: Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1972), Technology Acceptance Model (TAM) (Davis, 1989), the Motivational Model (Davis et al., 1992), Theory of Planned Behavior (TPB), Model of PC Utilization (MPCU), Innovation Diffusion Theory (IDT), and Social Cognitive Theory (SCT). The following section provides overview of TAM and UTAUT related adoption model.

#### **TAM and UTAUT Related Adoption Model**

Davis (1989) introduced the TAM, which discovers how users of information systems come to accept and use technology. Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) are the key factors of the model. According to TAM, Perceived Usefulness

(PU) is defined as “the degree to which a person believes that using a particular system would enhance his or her job performance”. Also, Perceived Ease of Use (PEOU) is defined as the “the degree to which a person believes that using a particular system would be free of effort” (Davis, 1989).

TAM is expanded to TAM2 (Venkatesh & Davis, 2000; Venkatesh, 2000), UTAUT (Venkatesh et al., 2003), and TAM3 (Venkatesh et al., 2008). TAM 2 extends TAM by adding the subjective norm, which exerts a significant direct effect on usage intentions over and above perceived usefulness and perceived ease of use (Venkatesh & Davis, 2000). TAM3 that the effect of perceived ease of use on perceived usefulness will be moderated by experience; and the determinants of perceived ease of use will not have any significant effects on perceived usefulness over and above the determinants of perceived usefulness (Venkatesh et al., 2008).

Venkatesh et al. (2003) introduced the UTAUT. The model proposes that four key constructs, including performance expectancy, effort expectancy, social influence, and facilitating conditions are direct determinates of usage intention and behavior (Venkatesh et al., 2003). Gender, age, experience, and voluntariness of use are posited to mediate the impact of the four key constructs on usage intention and behavior (Venkatesh et al., 2003). Subsequent validation of UTAUT in a longitudinal study found it to account for 70% of the variance in usage intention (Venkatesh et al., 2003). Im et al. (2011) tested and compared the UTAUT model. They found variables in the well-accepted UTAUT model vary across countries. Zhou et al. (2010) integrated Task Technology Fit (TTF) model and UTAUT model to research the mobile banking user adoption model. They proposed that performance expectancy, task technology fit, social influence, and facilitating conditions

have significant effects on user adoption. Dai and Palvia (2009) conducted a study on 190 individual mobile commerce users in China and the United States of America. Dai and Palvia (2008) also identified nine factors that affect mobile commerce adoption by consumers in China and the USA based on the TAM.

### **Digital Divide**

Norris (2001) suggested that the digital divide is a multidimensional phenomenon that encompasses three distinct aspects: global, social, and democratic divides. Van Dijk (2012) proposed that differential accesses to ICTs is related to individual characteristics: level of income and education, employment, age, sex, and ethnicity. According to the National Telecommunications and Information Administration (NTIA), Native Americans, African Americans, low-income persons, and the less educated are more likely to lack access to information resources, especially when they reside in rural areas or central cities (McConnaughey et al., 1999).

Chakraborty and Bosman (2005) measured the inequalities in home PC ownership in the United States by applying the Lorenz Curve and the Gini coefficient. Based on the data gathered in 2011, they found out that the inequalities in PC ownership are substantially smaller among white households than among African American households in the United States. According to Mossberger and Tolbert (2003), the most important factors affecting access to information technology are race and economic resource. From 1837 valid responses, African Americans and Latinos generally have lower access to the information technology. In a study conducted by NTIA in 2010, household broadband Internet use rate for Native Americans was only 48.3%, and 49.4% for African American, while the average overall average was 63.5% (NTIA, 2010).

The second-level digital divide was introduced in 2002 to eliminate the binary classification of technology use by only taking into account whether somebody does or does not take the Internet into consideration (Hargittai, 2002). In a study conducted by Blanchflower et al. (2003), it was identified that Native American owned and African American owned small businesses face challenges when obtaining credit that go beyond observable differences in their creditworthiness. Chen et al. (2006) conducted a case study on a Native American owned manufacturing enterprise's efforts to implement new strategies for expansion and diversification. Garsombke and Garsombke (2000) conducted comparative analysis on Native American entrepreneurs and non-Native American entrepreneurs. Findings suggested that parents being an entrepreneur, objective versus subjective thinking, orientation and perceived barriers to startup are the potential differences between the two types of businesses.

### **Small and Medium-Sized Enterprises**

Overall, SMEs are independent firms and companies which tend to have fewer employees and lower sales volumes compared to large firms and companies. Different definitions are given in different organizations and countries. For example, Organisation for European Economic Co-operation (OECD) and European Union (EU) designate the upper limit of employees for SME as 200 employees (OECD, 2015). United States Small Business Administration defines the upper limit of employees for SME as 500 employees (Summary, 2011).

One type of SMEs, small businesses are businesses that have fewer than 100 employees in many countries and regions (OECD, 2015). Small businesses, including micro-enterprises, currently represent 99.7 percent of all businesses in the United States

(Summary, 2011). Over the last two decades, they have generated nearly 64 percent of all new jobs in the country while creating more than half of the nonfarm private GDP (USSBA, 2011; Kobe, 2007; CHI Research, 2003). According to data from the United States Census Bureau (2011), there were more than 10 million small businesses operating in the United States. As these businesses are the driving force and the central factor influencing the economic growth and development of communities, it is important to understand how ICTs can support the growth and maintain the sustainable development of these small businesses (Qureshi & Lamsam, 2008; Chen, Parker, & Lin, 2006; Garsombke & Garsombke, 2000; Varma, 2005).

### **Native American and African American Owned Small business**

Micro-enterprises face unique challenges in their operations. Schreiner and Woller (2003) identify several challenges such as limited access to financial services, relatively high operation and labor costs, lack of skills and expertise, and education. Servon (2006) identified the insufficient use of technology in micro-enterprises in the United States. While developing countries like Kenya became the world leader in mobile banking (Economist, 2013), many small businesses in the United States, including Native American and African American owned micro-enterprises, are facing unique challenges in the adoption of ICTs to improve business performance and achieve economic development.

In the last three decades, economic and ICTs development in Native American communities and reservations has focused on tribally owned businesses and to a lesser extent, industrial parks. In part, the tribal-based focus over individual development is culturally based. Most Native societies tend to be collectivistic rather than individualistic,



and entrepreneurialism is associated with the latter. The lack of African-American owned small businesses was observed in the United States (Fairlie, 1999).

Unemployment and poverty rates rose sharply in the United States over the course of the recession. The effect of the recession has been particularly acute in Native American and African American populations, particularly, in the Midwest. According to the pew research center, 1-in-4 Native Americans and Alaska Natives were living in poverty and their unemployment rates rose to 11.3% in 2013 and have had the highest unemployment rates in the Midwest of 16.8% (Austin, 2013; Krogstad, 2014; Macartney, Bishaw, & Fontenot, 2013). Similarly, the unemployment rate among African Americans is at 13.4% (Desilver, 2013). Poverty rates in the Midwest are particularly high among African Americans and Native Americans. The US Census Bureau reports that the highest national poverty rates were for American Indians and Alaska Natives (27.0%) and Blacks or African Americans (25.8%) (Austin, 2013).

Even though the micro-enterprise movement in third world countries has garnered media attention, tribal government perceptions of entrepreneurial development in Native American communities remained stagnant. The federal government's Bureau of Indian Affairs had effectively set a standard of economic development that eschewed individuals in favor of tribal economies that remained dependent upon the United States. As small businesses represent the majority of all firms in the United States, this dissertation analyzes and discovers the key concepts relating to how IT adoption in these businesses leads to development outcomes among Native American and African American Communities. These businesses are the driving force and the central ingredient behind the economic

growth and community development in the United States (Qureshi & Lamsam, 2008, Chen et al., 2006, Garsombke & Garsombke 2000, Varma, 2005).

In the meantime, micro-enterprise as a means of economic recovery made its way to the United States from the global stage to urban centers and to the state governments. It is well known that small businesses comprise the majority of businesses in regions of the world that are developing (Schreiner & Woller, 2003; Roztocky & Weistroffer, 2009). They also comprise the majority of employment in Nebraska<sup>1</sup>. The micro-enterprise movement received increasing media coverage that trickled down from the United States national media, such as the New York Times, to regional and finally local media. Public perception and awareness of micro-enterprise development was broad-based and generally positive. Native American communities and African American communities – increasingly connected via mobile technology – were also becoming more aware of micro-enterprises.

Qureshi et al. (2009) found that targeted IT interventions in micro-enterprises increase their chances of survival and stimulates their growth. Other studies in the adoption of IT in micro-enterprises have shown that effective IT interventions may have considerable potential for facilitating IT adoption among micro-enterprises across the United States and the world (Song & Qureshi, 2010; Kamal et al., 2010). The long period of rapid development of the United States economy over the past ten years coincides with significant investment in and diffusion of ICTs and their applications (Schreyer, 2000). Yet,

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<sup>1</sup> <http://www.census.gov/econ/subj/> See Appendix for detailed information

Native American and African American owned businesses continue to remain at the fringes of this prosperity.

While it has been recognized that small businesses are important for industrialization, it is not clear how their growth can be supported. The use of ICTs is still a challenge, especially among Native Americans owned small businesses. As a “missing piece” of the research and teaching (Tipton, 2004; Nebraska Sioux Lean Beef, 2008), the use of ICTs is a challenge among Native Americans owned small businesses, especially from women in rural areas of the US (Aspaas, 2004; Jahrig, 1996). Their unique way of viewing ICTs means that their frames of reference need to be addressed when considering use of the technologies (Qureshi & Lamsam, 2008). Small businesses face several challenges when adopting ICTs. SMEs are significantly limited regarding financial and human capital (Thong, 1999). They generally have limited access to market information (Madrid-Guijarro et al., 2009) and rarely use strategic techniques such as financial analysis, forecasting, and project management (Blili & Raymond, 1993; Ghobakhloo et al., 2011). The readiness, availability, and uptake issues of ICTs will remain relevant for at least a generation (Heeks, 2008). While very few Native American small businesses owners were aware of public and private resources (Swinney & Runyan, 2007), the technopreneurship in Native American businesses faced training and financial issues (Chen et al., 2006).

As part of the dissertation, the research seeks to investigate the relationships between IT adoption and contextual factors and examine how these relationships vary across Native American and African American owned micro-enterprises in a United States Midwestern city. The research also seeks to understand the relationships between IT adoption and contextual factors, and examine how these relationships vary across Native

American and African American small businesses and micro-enterprises in the United States.

The majority of revenue-generating enterprises in Native American communities are tribally owned (National Rural Funders Collaborative, 2014). The businesses owned by individuals are underdeveloped due to several barriers like lack of access to capital and financial service, lack of effective leadership, and lack of local role models (Deweese & Foxworth, 2013). The Effective State Policy and Practice identifies several challenges Native American small businesses are facing (National Rural Funders Collaborative, 2014). First, there is a lack of business development training and technical assistance resources. Second, there are low levels of general financial literacy. Third, there is inadequate and inappropriate financing for Native American enterprises. There is also a lack of Native American participation in the Computer Science (CS)/Computer Engineering (CE) program (Varma, 2005). The lack of education in computers and computer-related courses in high school, personal motivation, the small number of Native Americans in higher education, and the lack of encouragement from family and friends could be contributing factors influencing the lack of Native participation in CS/CE programs (Varma, 2005). Meanwhile, the Native American schools are facing several challenges of modern digital technologies (Richardson & McLeod, 2011).

Despite the high access and use of ICTs in the United States, already high unemployment and poverty rates among Native Americans continue to rise, deepening existing income inequalities. Although ICT adoption has enabled small businesses to grow, Native American small owned businesses have received little attention or support. Native American small business owners have a more collectivist culture while most

entrepreneurship follows an individualistic culture. In addition, the technology is designed to support this individualistic culture. Part of dissertation involves the diagnosis of ICT needs and challenges faced by Native American small business owners, selection of technology interventions, implementation of these technology interventions (together with training of the small business owners), and assessment of development outcomes from these interventions.

### CHAPTER 3: LITERATURE REVIEW

This chapter further answers the first research question, which is *How do IS researchers approach and conceptualize the IT4D research on SMEs?* Several research gaps are identified in the literature related to the ways in which ICT can be used to improve people's lives. Literature review usually serves as two roles in IS research, one is as a research method in itself and the other as the preparation for future research (Pickard, 2012, p25). Literature review is a powerful research methodology in IS domain since it helps identify the critical knowledge gaps between the existing research and future research. As Webster and Watson (2002) pointed out, there are few literature review publications in IS research. Hence, this dissertation adopts the multi-facet critical analysis strategies of the publications in IS research (Zhang et al., 2011) to fill the research gaps in the IT4D research on SMEs.

To understand the state of IT4D research on SMEs, and to a larger extent, to understand the ways IS scholars conduct research on IT4D research, we propose the research question for the literature review section, *RQ 1. How do IS researchers approach and conceptualize the IT4D research on SMEs?*

**Table 5. Literature Review Process**

<b>Stages and Steps of Research</b>	<b>Descriptions of Activities</b>
Information Seeking and Retrieval	Identify appropriate key words; Search appropriate online resources of literature
Evaluation	Judge the source based on the subjects of the publications
Critical Analysis	Systematically analyze and examine the literature
Research Synthesis	Synthesize the concepts, evidences, and future trends in the literature

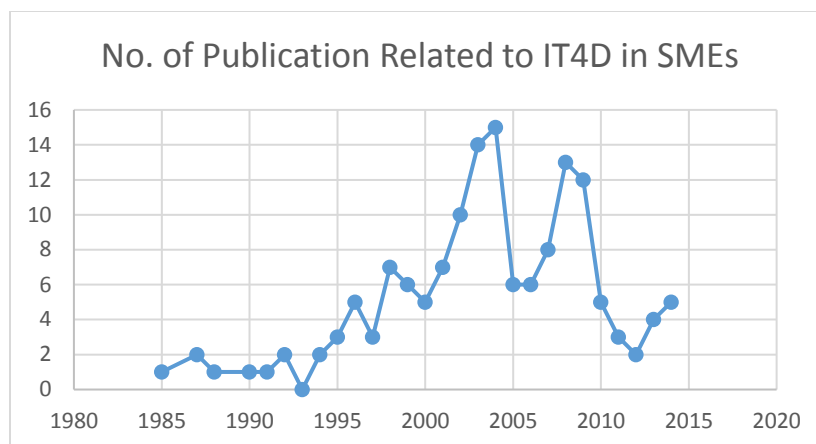
## **Information Seeking and Retrieval**

This section carries out content analysis of publications in Information Systems research as they relate to how Information and Communications Technology relate to Development outcomes in SMEs. In order to provide a holistic picture of the IS related research of IT4D on SMEs and to answer the research question, we decided to use two main academic databases, Google Scholar and ProQuest. Several search criteria are set in order to get more accurate data. All paper are peer-reviewed within the IS domain. Keywords are “Small and Medium-Sized Enterprises”, “Small Business”, “Information Technology”, “Information Systems”, and “Development”.

After the results were provided based on keywords, a sample of 1000 paper were selected from database to help identify the current research stream of the ICT4D in SMEs. Judgement sampling method was conducted and 149 papers were identified as the appropriate and representative papers. The following section provides the discussions on the topics that are gathered based on 149 papers.

## **Results, Findings, and Evaluation from Literature**

Based on search results from the database, 149 papers were selected and surveyed using the above criteria. Figure 2 provides distribution of publications related to IT4D in SMEs from 1985-2014.



**Figure 2. Distribution of Publications Related to IT4D in SMEs from 1985-2014**

Based on Figure 2, the earliest research from the sample was published in 1985, where Raymond (1985) discussed different factors and characteristics that could lead to the MIS success of small businesses. The latest paper from sample was published in 2014. More and more research attention was paid from 1994, and most of the publications were published between 2000 to 2010. Since there are differences factors that would lead to the order of the results, for example, citations, types of publications, publication year, and relevance to the keywords, publications in 2015 were not found from the sample.

From 149 publications, including key journals, conferences, and workshops in IT4D in SMEs are identified. Table 6 provides information about different types of journals, conferences, and workshops that were retrieved from the sample. Based on the sample paper, 28 journals and 3 conferences/workshops are identified as key publications in IT4D in SMEs. Within the journals, about 10% of the paper were published in *Journal of Small Business Management*. Most of the publication for this journals are related to IT adoption. For example, Dibrell et al. (2008) investigated the mediating effects of IT on the



relationships among product and process innovations and small business performance. Karagozoglu and Lindell (1998) studied the internationalization of technology-based SMEs where they emphasize the importance of innovation. Publications from *Journal of Small business and Enterprise Development* and *Small Business Economics* contribute 13.4% of the sample publications. Both publications focus on the management and economic sides of IT4D in SMEs. Based on table 6, IS related journals (*MIS quarterly*, *European Journal of Information Systems*, *Information Technology for Development*, *Information Technologies & International Development*, *Journal of Information Technology*, *Information Systems Journal*, *Information Systems Research*, *Journal of Information Systems and Small Business*, *Journal of Information Technology Theory and Application*, *Information Systems Journal*, *Annual SIG GlobDev Pre-ICIS Workshop*, and *AMCIS*) contribute to 28.9% of the overall sample.

**Table 6. Key Publications in IT4D in SMEs**

Types of Publications	Names of Publications	Publications No.	Types of Publications	Names of Publications	Publications No.
Journal	Journal of Small Business Management	15	Journal	World Development	2
Journal	Journal of Small business and Enterprise Development	12	Journal	Decision Sciences	2
Journal	Small Business Economics	8	Journal	Information Systems Journal	1
Journal	Information & management	7	Journal	Information Systems Research	1
Journal	MIS quarterly	7	Journal	International Journal of Business and Information	1
Journal	European Journal of Information Systems	6	Journal	International Journal of Electronic Commerce	1
Journal	Information Technology for Development	6	Journal	International Journal of Entrepreneurial Behavior &	1
Journal	International Small Business Journal	6	Journal	International Journal of Information Management	1
Journal	Information Technologies & International Development	3	Journal	Journal of Enterprise Information Management	1
Journal	Internet Research	3	Journal	Journal of Information Systems and Small Business	1
Journal	Benchmarking: An International Journal	2	Journal	Journal of Information Technology Theory and	1
Journal	International Journal of Business and Management	2	Journal	Management Science	1
Journal	Journal of Information Technology	2	Journal	World Development	2
Journal	Omega	2	Journal	Information Systems Journal	1
Journal	The Information Society	2	Workshop	Annual SIG GlobDev Pre-ICIS Workshop	8
Journal	The Journal of Computer Information Systems	2	Conference	AMCIS	2
Conference	PACIS	2	Other	Other	39

**Table 7. Research Categories and Sample Paper of IT4D in SMEs**

Categories	No. of Paper	Percent age	Representative Papers
<i>1. Information Technology Adoption Research on SMEs</i>	47	31.54%	Molla et al. (2006), Shiels et al. (2003), Premkumar & Roberts (1999)
<i>2. Different Approaches to promote ICT in SMEs</i>	27	18.12%	Riemenschneider et al. (2003), Kamal et al. (2011)
<i>3. Individual and organizational use of Information Technology in SMEs</i>	24	16.11%	McGee & Sawyerr (2003), Thong et al. (1996)
<i>4. Development Outcomes and Evaluation in SMEs</i>	51	34.23%	Schreiner & Woller (2003), Street & Meister (2004), Raymond (1985)

Based on the data, Information Technology Adoption Research on SMEs, Different Approaches to promote ICT in SMEs, Individual and organizational use of Information Technology in SMEs, and Development Outcomes and Evaluation in SMEs are identified as key research categories. Table 7 reports different categories, the percentage of each category and representative publication. The data on the papers were grouped into four categories. The following section provides descriptions, justifications, and examples from each categories.

### **Information Technology Adoption Research on SMEs**

The largest number of papers falls into this category with 47 papers, which comprise of 31.54% of the samples are IT adoption research on SMEs. IT adoption related research on SMEs are observed throughout the literature. Diffusion of innovation theory (DOI) was developed by Rogers in 1962. Nui (2007) conducted case study on the IT adoption for a small internet retailer in Turkey. Manochehri et al. (2012) identified that there is a need for more training facilities for adopting ICT in SMEs in Qatar. MacGregor and Vrazalic (2005) developed a model of e-commerce adoption barriers for the SMEs in Sweden and Australia. From the 477 small businesses, they discovered that e-commerce is either “too difficult” or “unsuitable” for the businesses.

King and He (2006) conducted a meta-analysis of the technology acceptance model. They found out the TAM might have wider applicability. Barba-Sánchez et al. (2007) conducted a survey for the benefits that SMEs can get from the ICT adoption, which are enhanced productivity, favor the new adoption model, access to new market, and improved qualification. Im et al. (2011) compared the IT adoption research utilizing the UTAUT model. Two technologies, including MP3 player and Internet banking are

compared between Korea and the United States. They discovered that the effects of effort expectancy on behavioral intention and the effects of behavioral intention on use behavior were greater in the sample from the United States. Antlová (2009) provided the motivation and barriers of ICT adoption in SMEs.

### **Different Approaches to Promote ICT in SMEs**

The second largest number of papers (27), comprising 18.12% of the papers from sample, are related to different approaches to promote ICT in SMEs. While there are several different ways to measure the adoption of ICT in SMEs, there are different approaches to promote the ICT in SMEs as well. Early in 1988, Montazemi (1988) determined that the “simple organizational structure” of small businesses, which is different than large organization, can be a double-edge sword during the adoption process of ICT. Iacovou et al. (1995) discovered that the organizational readiness, external pressures to adopt, and perceived benefits are the important factors that would lead to the adoption of Electronic Data Interchange (EDI). Martin and Matlay (2001) introduced the “Blanket” approaches to promote ICT in small businesses. They emphasized the importance of human capital as well as the location of the firm. Matlay and Addis (2003) highlighted the importance of education during the IT adoption of small businesses. Donner (2004) studied the mobile phone usage of small business owners in Rwanda, and discovered that there are different reasons and motivations why each individual small business owner chooses to use the technology. This is also supported in Duncombe and Heeks (2002), where they highlighted that ICTs may play a supplementary role for the development of small businesses in Botswana. Barba-Sánchez et al. (2007) conducted a literature review of different drivers, benefits, and challenges of ICT adoption by SMEs.

They discovered that the small entrepreneurs and the innovation orientation are the key factors in the ICT adoption and promotion process for the SMEs.

Riemenschneider et al. (2003) introduced a collected model for IT adoption research in SMEs with TPB and TAM. Li et al. (2011) analyzed the usage of online direct sales channels among SMEs. A survey was applied to SMEs in the United States. They found that there are different sets of factors that can determine the SMEs' initial adoption and post-adoption. Quaddus and Hofmeyer (2007) identified factors influencing the adoption of B2B trading exchanges in small businesses. They found the external factors will largely raise the businesses' awareness of the innovation during the adoption process. Al-Natour and Benbasat (2009) indicated that more and more research attention was paid to the factors about the use of IT artifacts, rather than the traditional models like TAM and TPB. Given the relevance of the need to understand IT adoption, we draw upon a unified model that has been widely cited in the literature. In the following sections we add to the literature by developing a model that includes the concept of development, and how ICT usage affects development. Thus, it suggests that those two factors usually play critical roles during the ICT adoption process. Most of the literature focuses on the individual, i.e. the business owners' use of ICT as well as the organizational use of the ICTs. The following section describes the differences between the two.

### **Individual and Organizational Use of Information Technology in SMEs**

The third category with 16.11% of the sample, comprises 24 papers which are related to individual and organizational use of IT in SMEs. Williams et al. (2011) provided a systematic review of citations of UTAUT's originating article, and they discovered that only 3.6% of the sample publications have actually made use of the theory, which means

UTAUT may not be fully suited for all circumstances. On the other hand, as TAM and UTAUT are based on individual usage of a particular technology, it is hard to get an overall picture of IT use within an organization. Thus, it might not be appropriate to use either of the models to measure and assess the actual use of technology. Li (2010) provided a critical review of technology acceptance literature. Author found that there are inconsistent, sometimes even contradictory empirical results from all major relations in TAM. For example, Alam et al. (2009) investigated the factors which influence the adoption and usage of ICT by the SMEs in Malaysia. They identified that perceived benefits, ICT knowledge and skill, and government support are significant elements of ICT adoption. However, the survey was delivered and finished by the business owners or managers, rather than the whole businesses. Similarly, Xiong et al. (2013) studied the small businesses IT adoption in China. However, only the small business owners were involved in the study. As TAM/UTAUT based adoption research focus on the individual usage of technologies, there is a need for researchers to go beyond the TAM/UTAUT based adoption research models.

### **Development Outcomes and Evaluation in SMEs**

Finally, 34.23% of the sample (51 papers) are related to development outcomes and evaluation in SMEs. Current research in IS focuses on how IT can be adopted by users. Yet, the majority of people in organizations adopt technology on a regular basis, and gains from the adoption of IT have only been assessed in a rudimentary fashion such as return on investment, net present value or transaction cost analysis. The bottom line of a business, community, or society relating to its survival and growth has not been connected to its use of IT. Limited research has been conducted in IS into understanding the outcomes of IT

adoption beyond variables affecting the user perceptions of technology. One way of assessing the ways in which technology can improve the lives of people is by assessing the ways in which the majority of businesses in the world, which are micro-enterprises, adopt technology. There is evidence to suggest that when these businesses use IT in innovative ways, they grow by a factor of 3.8 percent. (Qiang et al., 2003). As the effects of globalization are permeating multiple facets of life, organization and society, the relevance of IT4D research for the MIS community has become evident. Measures of economic development most often used are in terms of increase in income, job creation, and clientele (Qureshi et al., 2009). These measures will be used to assess development in small businesses in this research. This concept of development has its roots in the economics of the firm.

### **Gaps in the Literature**

Several research gaps are identified in the literature relate to the ways in which ICT can be used to improve people's lives. These are summarized as follows:

1. Limited research has been conducted in IS into studying the outcomes of IT adoption beyond variables affecting the user perceptions of technology.
2. Despite the innovations in technology that have been alleged to improve people's lives, little research has been carried out in the ways of assessing the ways in which technology can improve the lives of people.
3. While innovations in information systems have had an impact on multiple aspects of the way organizations do business and how communities and regions grow, little is known about how this impact takes place.
4. We need to understand how IT for development outcomes can be used to assess the growth of SMEs. Why do we need to know about how IT brings about development? Why does it matter?

5. While the majority of innovations in information systems appear to be taking place in the developed world, little research in information systems has attempted to understand why this is the case. How are these innovations affecting the lives of people?
6. Even though research suggests that SMEs that use ICTs for electronic commerce and for the support of their business not only survive but grow, little research has been conducted to explain why this is the case. The majority of businesses in the world are SMEs, yet that majority of IS research is conducted on the use of IT in large organizations.

As Cragg et al. (2002) pointed out, those development outcomes from ICT adoption have to be aligned with the small businesses. Alonso-Mendo et al. (2009) suggested that website redesign has to be aligned with the business functions of small businesses. It appears so far that SMEs and individuals within have a unique perspective towards the usage of ICTs, approaches to promote ICTs, and development outcomes. Areas that need to be studied to address the gaps are provided in the next section.

### **Ways Forward**

In order to move our understanding of how IT for development outcomes can be assessed in the growth of SMEs, we will need to understand the importance of human capital and empowerment as follows: 1) the importance of human capital within the SMEs and 2) the relationship between the development of SMEs and empowerment.

#### **The Human Capital within the SMEs**

The first area identifies human capital such as the education and IT skills of employees that effect economic and social development should also be emphasized towards the development of SMEs. Human capital is defined and created by changes in



individuals that increase skills and capabilities, enabling people to behave in new ways (Coleman, 1988). Human capital also can be described as all the competencies and commitments of the people within an organization (Ceridian, 2007).

Porter (1985, p. 394) noted that human capital has a role to play in lowering economic costs or in elevating customers' willingness to pay. Human capital can be assessed as education and social embeddedness. Social embeddedness is defined as the degree to which individuals or firms are enmeshed in a social network (Granovetter, 1985). Boyer-Wright and Kottermann (2008) compared E-government issues in emerging parts of the world, including Eastern European, Asian countries, and advanced countries. They noted that education and on-the-job training of individuals play important roles in ICT use in the three domains. Ngwenyama and Morawczynski (2009) indicated that economic factors, human capital, geography, and civil infrastructure factors should be considered during the analysis. Balamoune-Lutz (2003) argued that ICT diffusion was not associated with education by using the cross-sectional data from the World Economic Forum's (WEF) Government Information Technology Report (GITR).

Education and training expenditure are the key variables used to assess human capital. Education in its broadest, general sense is the means through which the aims and habits of a group of people sustain from one generation to the next. Training is the acquisition of knowledge, skills, and competencies as a result of the teaching of vocational or practical skills and knowledge that relate to specific useful competencies. Training has specific goals of improving one's capability, capacity, and performance. It forms the core of apprenticeships and provides the backbone of content at institutes of technology (also known as technical colleges or polytechnics).

## **The Relationship between the Development of SMEs and ICT Enabled Empowerment**

The second area to move forward for the research of IT4D in SMEs relates to the relationship between the development of SMEs and empowerment. As discussed in previous sections, there is a diversity of approaches to the sustainable development of SMEs. Some are very market-led and involve pricing nature, while others involve putting environmental protection at the heart of policy. Given the diversity of different development goals of SMEs, the relationship between the development of SMEs and empowerment should be properly investigated.

Empowerment can be treated as a relational construct in management and social science research where it is described as the “perceived power or control that an individual actor or organizational subunit has over others.” (Conger, 1988). Gutierrez (1990) identified the concept of empowerment as “a process of increasing personal, interpersonal, or political power so that individuals can take action to improve their life situations” (p. 149). Empowerment has been used to describe how people feel they can be in control of their own lives despite the challenges they face which limit their personal freedom (Qureshi & Lamsam, 2008). In particular, the Native American culture empowers their people when they pursue their ways of life in a collectivist manner. Yet, those ways of life are not often accepted in mainstream American culture, which is more individualistic. In a study conducted by Kimaro and Nhampossa (2005), IT initiatives were found to be top-down, and controlled by the power of top managers who usually do not have adequate skills to do so. This took away from empowering those who needed the IT to be in control of their lives.

Historically, empowerment has been viewed as a motivational construct (Conger & Kanungo, 1988). Hughes (2003) noted that there is a debate about whether women are ‘forced’ or ‘voluntarily’ self-employed when there is a broader definition of ‘push’ factors is used. Çakar and Ertürk (2010) compared the innovation capability of SMEs from the empowerment perspective. From 743 employees in 93 SMEs, they found that collectivism and innovation capability are highly associated with the empowering environment within the SMEs. Wyer and Mason (1999) determined that empowering management approaches are the key features of successful growth-oriented SMEs. Similar results were found by Gabriëlsson (2007). As Moyi (2003) pointed out, ICTs could potentially become the root of empowerment in the SMEs sectors.

Despite the above studies, empowerment has received very little attention in the SMEs context compared to large companies. Understanding whether or not empowerment could lead to the development of SMEs is another area to focus on. Thus, we propose the *RQ 2. What are the key factors that influence the adoption of technology for the small businesses, including micro-enterprises?*

## CHAPTER 4: RESEARCH MODEL AND METHODOLOGY

### Research Model

Based on the open questions proposed in Chapter 3, this dissertation adopts a mixed method approach that contains both inductive approach and deductive approach as methods of reasoning. The research uses both quantitative and qualitative research methods. The mixed methods research aims to bridge the qualitative and quantitative divide (Venkatesh et al., 2013). Overall there are four stages in the dissertation. The following sections provide information about the first three stages of the research.

The overall research model is presented in Figure 3. Three stages of research were conducted to help answer the research questions. In the first stage, a TOE and TAM integrative research model was adopted and tested. In the second stage, UTAUT integrative model was designed and validated. Finally, framing analysis approach was adopted.

**Table 8. Stages of the Research (Same with Table in Chapter 1)**

Time	Stages	Methods of Reasoning	Research Methodology	Data Sources	Theory Applied
2011-2012	1	Deductive	Case Study (Qualitative)	N/A	TOE/ Technology Spillovers
2011-2012	1	Deductive	Case Study (Qualitative)	Interview	TOE/TAM
2012-2013	1	Inductive	Case Study (Qualitative)	Interview	Social Embeddedness
2012-2013	2	Deductive	Questionnaires and Survey (Quantitative)	Survey	UTAUT
2012-2013	2	Deductive	Questionnaires and Survey (Quantitative)	Survey	UTAUT, Human Capital
2013-2014	2	Inductive	Cluster Analysis (Quantitative)	Literature Review	Economic/Social/Human Development
2013-2014	3	Inductive	Case Study (Qualitative)	Interview	Empowerment
2014-2015	3	Deductive	Case Study (Qualitative)	Interview	Digital Divide
2014-2015	3	Deductive	Framing Analysis (Qualitative)	Interview	Economic Development Outcomes, Empowerment
2014-2015	4	Inductive	Qualitative and Quantitative	All Above	All Above

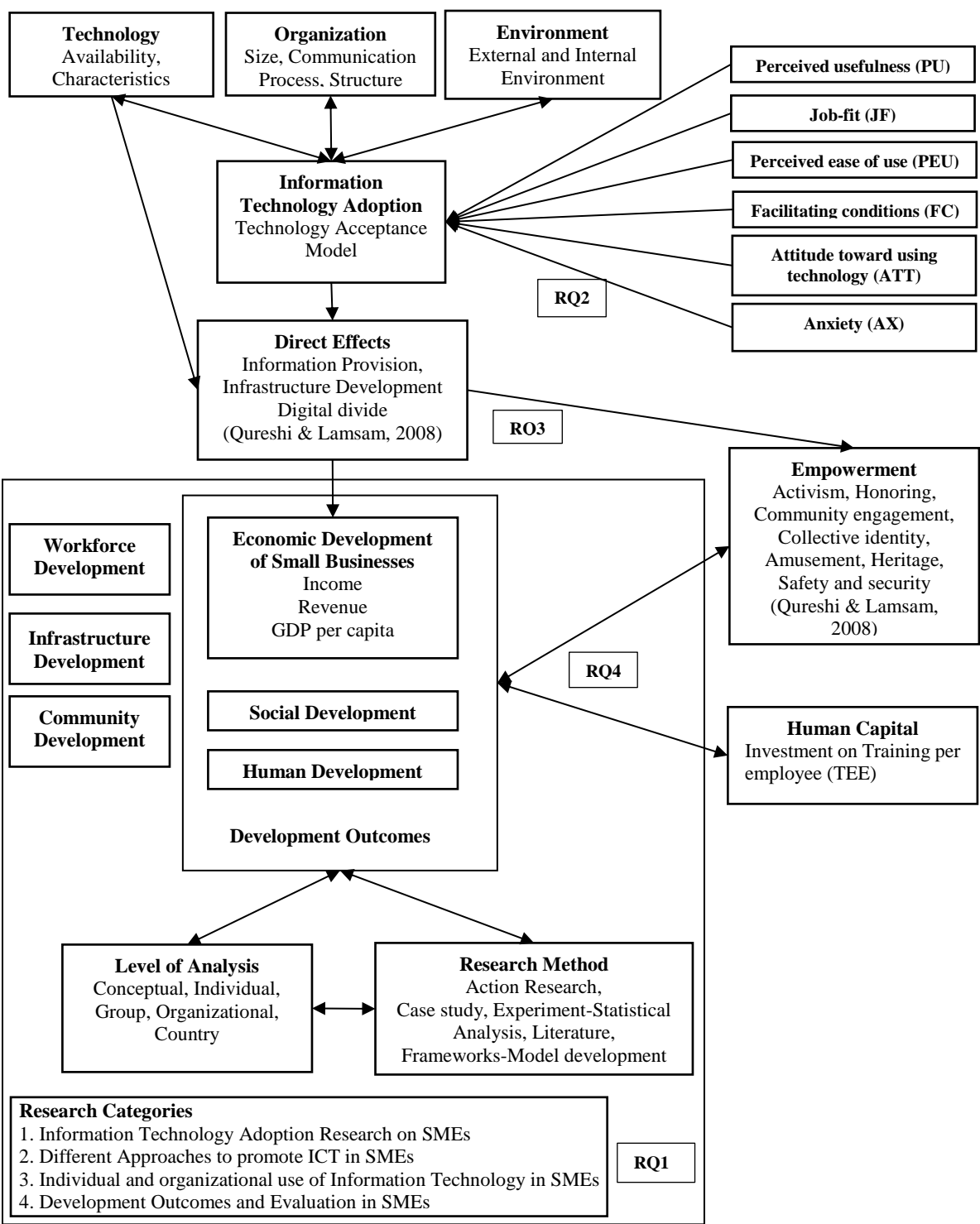
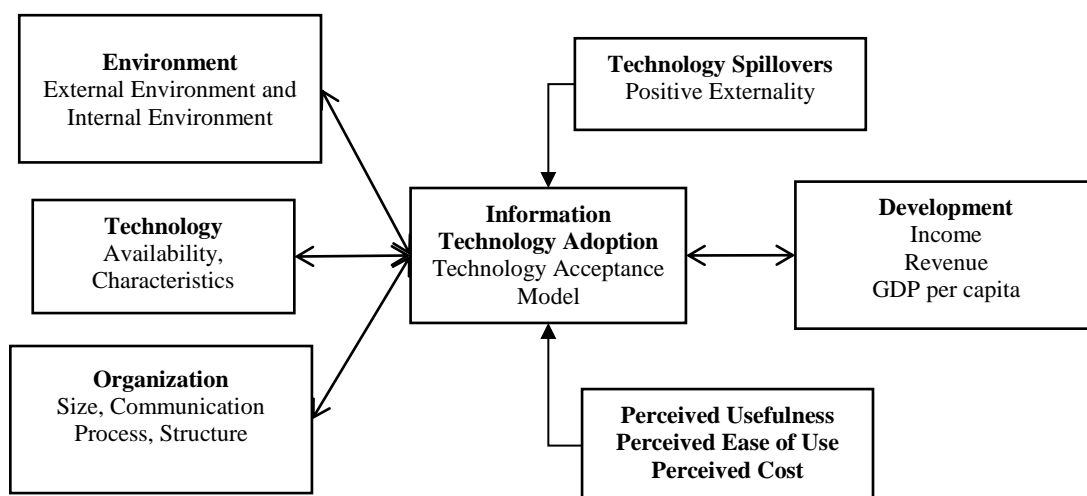


Figure 3. Overall Research Model

### Stage 1-TOE and TAM Integrative Research Model

An integrative research model that combines the TOE framework with the TAM is developed in the first stage of the research. We apply the technology spillovers as another important factor in the research model. Figure 4 shows the relationship between the factors affecting the information technology adoption.

We modified the Technology-Organization-Environment (TOE) framework developed by Tornatzky and Fleischer (1990), which comprehensively identifies factors shaping the IT adoption. Then, to understand the IT adoption, we integrate the Technology Acceptance Model (TAM) (Davis, 1989) to the model.



**Figure 4. Pilot Research Model-Stage 1-TOE and TAM integrative research model**

### Stage 2-UTAUT Integrative Model

A number of studies on the implementation of technology identify and assess organizational characteristics that could lead to an information system success or failure (Ginzberg, 1981). The UTAUT model includes several components, including

performance expectancy, effort expectancy, attitude toward using technology, social influence, facilitating conditions, self-efficacy, anxiety, and behavior intention to use the system. Based on the UTAUT model, we design the survey. User acceptance is one of the key fundamentals for development and success of small business. In this research we use the UTAUT model to develop our own model of how IT adoption and human capital can lead to the growth and development of small businesses.

The first part of our model uses variables from the UTAUT model. Performance expectancy is defined as the degree to which an individual believes that using the system will help him or her attain gains in job performance (Venkatesh et al., 2003). Davis (1989) and Davis et al. (1989) defined Perceived Usefulness as “The degree to which a person believes that using a particular system would enhance his or her job performance”. According to the TAM, the perceived usefulness refers to “the degree to which a person believes that using a particular system will enhance his/her job performance” (Davis, 1989, p320). The perceived ease of use is defined as the “the degree of freedom usage of the system and the technology for the users” (Davis, 1989, p320). The perceived cost is defined as the “value of money that has been used to get the service”.

### **Job-Fit**

The job-fit in this research is defined as “How the capabilities of a system enhance an individual’s job performance” (Thompson et al., 1991). There are two fit perceptions for the job seeker’s: personal organization fit and personal job fit (Carless, 2005). The personal organization fit is defined as “the compatibility between people and organizations that occurs when (a) at least one entity provides what the other needs, or (b) they share similar fundamental characteristics, or (c) both” (Kristof, 1996, p.4-5). The personal job fit

is conceptualized as the match between individual knowledge, skills, and abilities and demands of the job or the needs of an individual and what is provided by the job. (O'Reilly, Chatman, & Caldwell, 1991). Chang et al. (2010) investigated 303 research and development (R&D) engineers from 30 high-technology firms in Taiwan. The results showed that perceived P-O fit and perceived training investment interact jointly to predict knowledge workers' turnover intentions.

### **Perceived Ease of Use**

The perceived ease of use is referred as the “the degree of freedom usage of the system and the technology for the users” (Davis 1989, p.320). Oh et al. (2009) explored the adoption of e-trade innovations by SMEs operating in South Korea. The survey was conducted in 164 SMEs to develop a useful refined model of innovation acceptance and continuity.

### **Social Influence**

Social influence is referred as “the person's perception that most people who are important to him think he should not perform the behavior in question” (Ajzen, 1991; Fishbein & Ajzen 1975). Chay (1992) examined the relationship between social support and personality factors as moderators of stress arising from demands in the small business entrepreneurs and employees. Hsu and Lin (2008) investigated the usage of blog by researching the roles of technology acceptance, social influence, and knowledge sharing motivation. Theoretically, individuals' perceptions of norms consist of two influences: informational and normative (Deutsch & Gerard, 1995). The first occurs if a user perceives information as enhancing his or her knowledge; the second occurs when a person conforms to the expectations of others in order to obtain a reward or avoid punishment.



### **Facilitating Conditions**

Facilitating Conditions are referred as “Objective factors in the environment that observers agree make an act easy to do, including the provision of computer support” (Thompson et al., 1991). Venkatesh et al. (2008) researched the predicting different conceptualizations of system use by research the competing roles of behavioral intention, facilitating conditions, and behavioral expectation. They proposed the relationship between facilitating conditions and system use to be fully mediated by behavioral expectation. They also argued that facilitating conditions are expected to be more important for women than they are for men.

### **Attitude toward using technology**

Attitude toward using technology is referred as “An individual’s positive or negative feelings about performing and using technology” (Davis, Bagozzi, & Warshaw, 1989; Fishbein & Ajzen, 1975). Ha and Stoel (2009) integrated e-shopping quality, enjoyment, and trust into a technology acceptance model to understand consumer acceptance of e-shopping. 289 Surveys were conducted among college students. The results indicated that ease of use and enjoyment, and knowledge sharing (altruism and reputation) were positively related to attitude toward blogging, and accounted for 78% of the variance. They also found out that attitude toward blogging significantly influenced a blog participant’s intention to continue to use blogs.

### **Self-Efficacy**

Self-Efficacy in this research is referred as “Judgment of one’s ability to use a technology, e.g., computer, telephone, to accomplish a particular job or task” (Bandura,

1986; Compeau & Higgins, 1995). Schwarzer et al. (1997) compared the German, Spanish, and Chinese versions of general self-efficacy scale. Surveys were conducted among 430 German, 959 Costa Rican, and 293 Chinese university students.

### **Anxiety**

Anxiety in our research is referred as “Evoking anxious or emotional reactions when it comes to performing using the ICT” (Bandura, 1986; Compeau & Higgins, 1995). Beaudry and Pinsonneault (2010) identified anxiety was negatively related to IT use, both directly and indirectly through psychological distancing. Anxiety was also indirectly positively related to IT use through seeking social support, which countered the original negative effect of anxiety.

### **The Usage of ICT**

The usage of ICT consists of Behavioral Intention and Use behavior of the ICT. The behavioral intention to use the system was measured by using the three-item scale from Davis et al. (1989), which was widely used and tested before. The concept was originally adopted from Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). According to TRA, an individual’s performance of a specified behavior is determined by his/her behavioral intention to perform the behavior (Davis et al. 1989). Intention as a predictor of behavior is playing an important and critical role. It has been well-established in IS literature and other disciplines (Venkatesh et al., 2003). Our model uses the three-item scale from Davis et al. (1989).

## **Proposed hypotheses in Stage 2**

Quantitative research, including factor analysis, and SEM, was conducted to empirically investigate factors and relationship in the model in stage 2 of the research. As we discussed above, job-fit, perceived ease of use, social influence, facilitating conditions, attitude toward using technology, self-efficacy, anxiety, human capital, development of small business are important parts that form the model.

An instrument is developed to further construct the research model. Important factors, e.g., perceived usefulness, perceived ease of use, social influence subjective norm, facilitating conditions, attitude toward using technology, self-efficacy, anxiety, usage of ICT, human capital, and development of small business are proposed with definition and survey questions which adopted from the UTAUT study of Venkatesh et al. (2003). Those represent independent and dependent variables utilized in the current research project. Research hypotheses are developed from the research model.

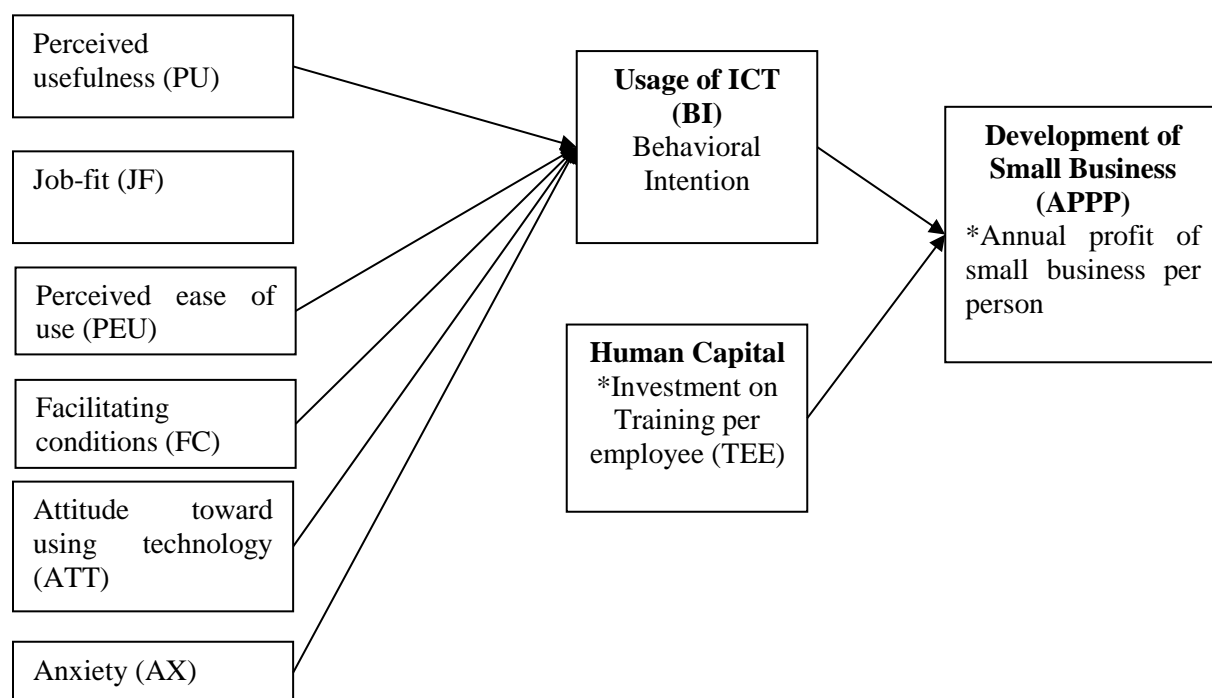
***H1: Perceived usefulness (PU), Job-Fit (JF), Perceived ease of use (PEU), Facilitating conditions (FC), Attitude toward using technology (ATT), and anxiety (AX) will make a positive impact on the usage of ICT.***

As first hypothesis comprises the first part of the research model, we expect to see the variables will have a positive impact on the usage of ICT among small businesses.

***H2: Usage of ICT and Human Capital will make a positive impact on the Development of Small Business.***

Human capital is described and created by changes in persons that bring about skills and capabilities that make them able to act in new ways (Coleman, 1988). Also, human

capital can be described as all the competencies and commitment of the people within an organization (Ceridian, 2007). Since the average spending on the employees is critical to the improvement of human capital for small businesses, in this research we expect to see ICT and Human Capital will make positive impact on the usage of Development of Small businesses in China. The Annual Cost of Training and Education Per Person (TEE) is considered as an important factor to probe the human capital of small businesses. Appendix C provides the instrument for the data collection based on the model.



**Figure 5: Initial Research Model for Stage 2**

Once collected, the data was analyzed in a two-step process. First factor analysis was conducted to examine how the responses on a number of measured variables influence each other. In other words, examination of patterns of correlations between the variables was conducted (Hair et al., 2005).

Since in the model there are more than five factors, factor analysis is conducted in the first step of the research. Given that a large number of measures were used in the data collection survey, this research uses factor analysis to arrive at a relatively small number of components that account for the variability. We conduct the factor analysis because we have obtained measures on a number of observed variables and we wish to develop a smaller number of artificial variables (Cattell, 1966; Hatcher & Stepanski, 1994). Factor analysis, including both principal component analysis and common factor analysis, is a statistical approach that can be used to analyze interrelationships among a large numbers of original variables into a smaller set to the structure of the variables considered; factor analysis becomes an objective basis for creating summated scales (Hair et al, 2010). The value of Kaiser-Meyer-Olkin (KMO) is 0.924. The value of Bartlett's test was significant at .001 level. Both values suggest the data set is suitable for factor analysis.

Data reduction was performed by conducting factor analysis to arrive at communalities (Smith, 2002). Extract Eigenvalues are provided to further support the analysis. Eigenvalues are applied in the factor analysis and is performed on the covariance matrix or the correlation matrix (in which each variable is scaled to have its sample variance equal to one). Varimax rotation was used because of better interpretation of the factor and factor loading (Hair et al., 2010). To measure sampling adequacy, KMO was used to test whether data was fitted to factors well based on correlation and partial correlation. KMO can be used to identify which variables to drop from the factor analysis because they lack multi-collinearity according to Hair et al. (2010). The measure of sampling adequacy (MSA) is measured by the KMO statistic. As a measure of sampling adequacy, the KMO predicts if data are likely to factor well based on correlation and partial

correlation (Hair et al., 2010). Factor rotation was applied to the data. Unrotated factor solutions extract factors in the order of their variance extracted. The first factor tends to be general factor and it counts for the largest amount of variance. The second and subsequent factors are then based on the residual amount of variance. Each accounts for successively smaller portions of variance Hair et al. (2010).

Once the data reduction was complete, the second step was regression to further investigate the impact the factors can make to the usage of ICT among small businesses in China. Then, multiple regressions were applied to analyze the relationship between variables. Both hypothesizes are tested based on the existing data.

### **Stage 3-Framing Analysis Methodology**

In order to investigate which factors affect Information Technology adoption by Native American and African American owned micro-enterprises, the model developed in Xiong, Qureshi, & Lamsam (2014) was applied to analyze the data collected in cases in Stage 3 of the research.

This research follows an inductive qualitative approach to find out which of the concepts in the model apply to Native American and African American owned micro-enterprises. Open coding was used to identify instances of the categories. Framing analysis was applied to arrive at an understanding of how ICTs can support the development of Native American and African American owned micro-enterprises. Through framing analysis, the ways in which ICTs may be perceived and used can be explored from the perspective of micro-enterprises. Data was analyzed to show which aspects of the model holds for Native American and African American owned micro-enterprises. This framing

analysis of Native American and African American owned micro-enterprises also enables us to arrive at new categories that are unique to these businesses.

In order to build a model of effects of ICTs on the digital divide from Native American and African American micro-enterprises, a research strategy is presented to build the concepts in a model and a qualitative strategy to operate the model. This research follows the socio-economic definition to illustrate the development, i.e., development is considered as the improvement of the social system and economic growth. This is a qualitative inductive research that investigates three cases of micro-enterprises in underserved communities of a Midwestern city. This research uses concepts from the literature as a lens to collect data and analyze the effects of the digital divide in the three minority-owned businesses. These research questions are investigated through frames developed by Qureshi and Lamsam (2008). Data was collected through interviews and observations to discover key characteristics of Native American and African American micro-entrepreneurs that influence their use of ICTs in their businesses. A framing analysis of the data enables the researchers to identify themes and frames that relate to how the micro-enterprises compare with each other in their use of ICTs.

### **Framing Analysis**

In this stage of research, framing analysis is used to arrive at an understanding of how ICTs can support the development of Native American and African American owned micro-enterprises. Through framing analysis, the ways in which ICTs may be perceived and used can be explored. This approach also help researchers “bridge ideas back in” (Oliver & Johnston, 2000). This framing analysis follows a constant comparison approach in which a wide range of meanings may be revealed through an objective procedure (Song,

2007). “The method begins with scrutinizing one text at a time and proceeds to create tentative categories of frames until a set of categories that are mutually exclusive and exhaustive for all frames comprising the articles is established” (Song, 2007, p 79). Through the framing analysis, this research will potentially build theory from data that was systematically gathered and analyzed from the research process.

As a multidisciplinary research method, framing/frames analysis has become popular in social science studies in communications, media, political behavior, and social movement (Druckman, 2001; Scheufele, 1999). While there are several definitions of frame/framing analysis, in this research we refer to the “words, images, and presentation styles that a speaker uses when relaying information to another” (Druckman, 2001, p227). In this definition, frames will often play an important role in shaping the meaning in the thoughts.

In Cornelissen and Werner’s (2014) levels of analysis, they identified that at micro level, the cognitive frame, frame of reference, and framing effects are the key research trends. In the meso level, the strategic frame, strategic framing, technological frame, and collective action frames are well observed. In the macro level, field frame, institutional frame, and frame contests/frame alignment are analyzed. Others suggest that a “cognitive lens” can be equipped in observing the changes in technologies (Kaplan & Tripsas, 2008). Barrett, Heracleous, and Walsham (2013) considered framing and ideology to be the central elements of computerization movement theory, and employ framing as a rhetorical strategy for advancing the technology. Leonardi (2011) pointed out, “culture does not directly shape the technological artifacts” (Leonardi, 2011, p347). As Native American



owned micro-enterprises' practices are deeply embedded in their cultural traditions, understanding their frames enables us to access their adoption patterns of technologies.

## CHAPTER 5: CASE STUDIES

Chapter 5 addresses the second research question, *What are the key factors that influence the adoption of technology for the small businesses, including micro-enterprises?*

Data was collected through interviews and surveys from 2011-2015. Case studies were carried out in person from six metropolitan-based micro-enterprises.

The following table provide detailed information about the data.

**Table 9. Data Collection Information**

Time	Location	Number of Small Businesses	Description
2012 Summer, Fall	California, Nebraska, USA; Zhejiang, Sichuan, China	6 in total	Interview data from small businesses in China and in the USA
2013 Summer	China	180 in total	Survey data from small businesses in China
2013 Fall Spring	Nebraska	4 in total	Interview data from small businesses in the USA
2014 Summer	Nebraska	6 in total	Native American owned micro-enterprises

### Criteria for case selection

Based on existing literature, with the help of ReferenceUSA<sup>2</sup>, which contains data of all registered U.S. based businesses, we established several criteria for selecting the cases. Reasons for selection consist of the following: 1) income levels are lower than the average income of small businesses, 2) micro-enterprises with fewer than 5 employees, and 3) businesses that will benefit from ICTs even though they are unable to access and

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<sup>2</sup> [www.referenceusa.com](http://www.referenceusa.com)

use ICTs because of their lack of knowledge and skills. These criteria were developed on the basis of the literature and previous studies in this area (see Qureshi et al., 2009). They are listed in Table 10:

**Table 10. Criteria for case selection**

<b>Description</b>	<b>Requirement</b>
<b>General Information</b>	The cases should be randomly chosen from the Database.
<b>Challenge</b>	The micro-enterprises are facing challenges in operation, e.g., lack of resources, lack of knowledge, and lack of skills.
<b>Ownership</b>	The ownership of micro-enterprise should be sole proprietorship or partnership.
<b>Potential</b>	The micro-enterprises should have 1) Potential to grow and expand their businesses by the usage of IT. 2) enough funds to invest in IT, and 3) desire to gain access to new markets.
<b>Years of operation</b>	The micro-enterprises should exist for more than one year, so that endogenous variables lead to the challenge, e.g., lack of cash flow, lack of management can be excluded.
<b>Scale of the Business</b>	The micro-enterprises should follow the criteria of the official definition micro-enterprise (Employees fewer than five)

### **Stage 1- Case Study**

The first case study was conducted in 2012 and 2013. In order to build a model of IT adoption for small businesses both in the USA and China, a research strategy is presented to build the concepts in a model and a quantitative strategy to operate the model. This research follows the socio-economic definition to illustrate adoption and development, i.e., development is considered as the improvement of the social system and economic growth. Research examines the differences of Information and Communication Technologies adoption by small businesses in the USA and China. Constructs from this research are used to develop a data collection instrument that was administered as series of case studies of small businesses selected in California and Nebraska compared to those in Zhejiang and

Sichuan respectively. California and Zhejiang are famous for the information technology industry and well-developed small businesses. Nebraska and Sichuan are agriculture-based states/provinces, and represent emerging areas in information technology adoption. The focus of this research will be on Nebraska and Sichuan. The details are provided below:

**Table 11. Comparison of Sichuan and Nebraska in Pilot Study**

	<b>Sichuan</b>	<b>Nebraska</b>
<b>Location</b>	Western China	Midwest USA
<b>Area</b>	187,000 sq mi 5th in China	77,354 sq mi 16th in United States
<b>Density</b>	470 /sq mi 22nd in China	24.0/sq mi 43 <sup>rd</sup> in United States
<b>Economic Status</b>	Less Developed in China	Less Developed in USA
<b>GDP Per Capita in 2010</b>	\$3129	\$49778
<b>GDP Per Capita Ranking</b>	25/31	17/50

Source: United States Census Bureau, Population Division (2011)

Two Chinese restaurants, one in Sichuan and the other in Nebraska are small businesses with fewer than 20 employees. Both of them are local chain stores. The restaurant in Nebraska applies advanced technology to its management. The restaurant in Sichuan does not use information technology as frequently as the restaurant in Nebraska. The results from these cases are analyzed using these questions:

## Case Study Questions

**Table 12. Initial Case Study Interview Question**

How often do the small businesses use information technology?
How much do the small businesses invest each year on the development of the Information Technology?
How do small businesses decide which technological innovations to adopt and which to avoid or pass on?
How do the small businesses select the appropriate technology? Is the technology for the small businesses different from for other businesses? What is lacking or different in the selection of technology?
What are the concerns that small businesses use the technology?
Does the usage of the technology improve the efficiency of finishing the tasks?
How easily it is for the employees in the small businesses to use the technology?
What is the revenue of the small businesses?

Data was collected through interviews carried out in person and over the phone. Comparisons of comparable small businesses in Sichuan and Nebraska were conducted. Surveys and interviews with small businesses were conducted. The following table describes the basic statistics of the two businesses:

**Table 13. Basic Comparison of Cases in Nebraska and Sichuan**

	<b>Small Business in China</b>	<b>Small Business in the United States</b>
<b>Location</b>	Southeast and Southwest part of Chengdu, Sichuan	Southeast Omaha and Bellevue, Nebraska
<b>Number of the restaurant chains</b>	2	2
<b>Number of Chain</b>	2	2
<b>Number of Employees</b>	14	10
<b>Average Age of the Employees</b>	30	27
<b>Number of the Seats</b>	20	30

<b>Annual Investment to the Information Technology Service</b>	\$500	\$3000
<b>Annual Revenue</b>	\$60000	\$100000
<b>Information Technology</b>	Telephone, Two-way radio, Wi-Fi connection	Telephone, Fax machine, Website, Credit Card Machine, Electronic Ordering System, Wi-Fi connection, Personal Computer, Database Management System, Customer Relationship Management Software. Online Accounting System.

### **Case Studies for Stage 1 and 3**

Data was collected through interviews carried out in person from six metropolitan-based micro-enterprises, two of which are owned by African Americans and four micro-enterprises owned by three Native Americans. These cases are described in the following sections.

#### **Case Study in China-C1**

The small business C1 over which the interview was conducted is in the capital of the Sichuan province, Chengdu. The restaurant is locally owned with two locations. They serve “simmer pot” food. This cooking style has a rich history which dates back to the Qing Dynasty. The location of the main restaurant is in the southeast part of the city, which is very close to Sichuan University. The other location is in the southwest part of the city. The major patrons of the store are students. The owner of the store has a college degree. There are two groups of employees, one group is primarily young people from the rural area of the Sichuan Province, and their ages range from 18-23. The majority of young people for the rural area have their high school diploma; none of them have college degree.

The other group of the employees are the people aging from 40-50. The majority of the employees from this age group do not have high school some of them are illiterate.

The owner of the restaurant invested \$500 in Information Technology each year. First, the restaurant acquired a fixed line telephone to attract more customers and maintain the existing customer base. The telephone enables the customers receive important information from the restaurant (e.g. the opening hours, the menu, and the location of the store) thereby improving both attraction of new customers and retention of existing customers. Second, each employee was given a two-way radio to help improve intercommunication. The two-way radio enabled the chef to make quick responses in accordance with the demand of the customers. This system reduces the customers' waiting time on an average of 10 minutes per ticket. Third, the restaurant provided a free basic Wi-Fi connection available in both the dining area and waiting area. This restaurant does not provide a website or the online ordering service. The restaurant does not accept credit card payments; only cash is accepted.

There are several reasons that small businesses in China do not use Information Technology frequently. First, the employees in the restaurant are afraid of the new technology. Most employees do not know how to operate a computer. Second, the low education level of the employees makes it hard to use information technology. As aforementioned, some workers are illiterate, which makes the process of educating an employee to use technology nearly impossible. Third, the high cost of the application of the information technology discourages small business use services like credit card processors, and high-speed fiber-optic internet connections. In China, the administration of credit card terminals is performed by banks. Small businesses have to pay a higher

“administration fee” per transaction than larger companies. Also Internet Service Providers (ISPs) in China charge much more for a business to use a telephone line and Internet connection than they do for personal use. Fourth, credit card use is still much less popular in China than cash due to the culture (especially in the western part of the China). Consumers consider cash a more secured form of payment than a credit card. In summary, the lack of employee knowledge, inability to educate employees and subsequent fear of information technology, high cost of technology, and cultural differences discourage small businesses in China from using information technology to support the business.

### **Case Study in China-C2**

C2 is a small business in Jiaxing, Zhejiang Province, China. The owner is a young Chinese man who has college degree in economics. The company provides international trade service for customers in the United States. The company was established in 2009. Currently there are 10 employees. Senior managers and new college students are the two groups. The company uses a lot of technologies. As it is an international trade company, majority of work is carried out online through email and instant message software. The company chose Taobao.Com and Alibaba.Com as the B2B service providers. However, the cost of information technology, e.g., international telephones calls, international fax, and business use of Internet is still a concern for the business owner. Besides, the new college students still need time to get familiar with the work under an information technology environment. The online training system provides opportunities for new employees to embrace the IT environment quickly. The company purchased a customer relationship management (CRM) system to help maintain the relationship between customers.



In this case, through the open coding, it was observed that very high perceived usefulness in the labels. However, high cost of ICTs in China really hinders the development of ICTs adoption, even though small business owner applies advanced ICTs like B2B, and CRM software.

### **Case Study in China-C3**

C3 is a family owned small business that provides production and sales of valves located in Yuhuan County, Zhejiang, China. Yuhuan is well known for the production of valves. There are five family members managing one plant and one sales center. Since production and sales of valves are a labor intensive industry which does not require high education, none of the employees has a college degree. According to the interview, a majority of the employees do not know how to use information technology related products. Currently, the small business uses telephone and fax machines to communicate with business partners and customers. Customers of C3 are not willing to use IT. Since all the sales and customers are in China, they only use telephone and fax machine. Second, due to the high cost of Internet connection for small business in China, the small business owner is not willing to spend extra on that. Third, the company tried the customer relationship management software before, but did not believe it's worth the money.

### **Case Study in the United States-CA1**

The small business CA1 selected from the United States of American comes from Omaha, Nebraska. This small business is a locally owned Chinese restaurant with two locations, one in the western part of Omaha and the other in Bellevue, which is a suburb of the Omaha metropolitan area. Majority of the customers do not come from one demographic, but instead come from a diverse background. The owner holds an MBA

degree from a local university. There are two sets of employees of the restaurant: one group is the founders of the restaurant. They work full-time and have advanced degrees from universities in the United States. The other group is primarily Chinese American and American college students who have part-time jobs. All of the employees have previous computer experiences.

The restaurant owner invested \$3000 in Information Technology this year. First, the company installed a fixed line telephone and a fax machine to maintain a relationship with existing customers and attract new customers. A telephone enables customers to order food, book a reservation, and get driving directions and parking information. A fax machine enables the restaurant to connect with other restaurants and other agencies more quickly than on the Internet. Second, the owners published a restaurant website to make general information available online. A website enables customers to order food and process the payment in advance, online. Third, the restaurant has a credit card terminal, making a wider variety of payment available to customers. Fourth, the restaurant also provides a free Wi-Fi connection for customers who are dining or waiting for carryout. Fourth, the restaurant purchased Customer Relationship Management (CRM) software and database management software to retain updated information on customers. Fifth, the restaurant purchased online accounting systems to securely retain customer billing and payment information.

There are several reasons that small businesses in the United States use information technology more often. First, the employees are willing to use the technology; most of them have experience with the computer systems. Second, the employees are properly educated and this enables them to use ITC more thoroughly. All of the employees have or are in

pursuit of a college degree. Some employees have software certifications. Third, the low cost of information technology enables more freedom of its usage. Compared to an average income, the cost of software and Internet service will be much lower in the United States, especially in Midwest. Fourth, credit card is one of the most popular payment channels in the United States due to the culture and a robust credit card processing system. In summary, the relevant skills required of the job, proper education level, low cost of information technology and the robust credit card processing system encourage small businesses to use ITC more frequently.

### **Case Study in the United States-CA2**

CA2 is another small business in the western part of the Omaha, Nebraska. The owner of the small business has more than 10 years' experience in the restaurant industry. However, the owner cannot speak or write English, which limits his ability to communicate with the customers. The owner has concern about the technology. Currently, the restaurant uses the telephone to accept orders. CA2 has the Wireless Digital Drive-Thru System, enabling clear and consistent communications with both customers and employees. The limited employees can perform very efficiently. The system saves a lot of time for the business owners. Free Wi-Fi connection is available for customers.

### **Native American Business-N1**

N1 is a family-owned store. Both the owner and founder are Native Americans. Currently, only 0.7% of the population are Native Americans in this Midwestern metropolitan area. The store offers an assortment of turquoise and silver jewelry, bead and quillwork, pottery, Pendleton and saddle blankets, buckskins, arrows, dream catchers,

kachina dolls, wood carvings, t-shirts, books, Native American music, teas, herbs, flutes, and craft supplies.

Currently the owner is the daughter of the founders. Due to the insufficient funding for the business, the owner could not afford to hire employees. However, from 2007 to 2008, the owner did hire several part-time employees to support the micro-enterprise. The owner is trying different ways to promote her business, not only including commercials from TV, magazine, and yellow book, but also from the Internet. The owner purchased a domain and a website was outsourced to a third party with monthly subscription. The owner's son helped establish a Facebook account for the store. Occasionally, promotions are conducted via Facebook and the website. The owner of the store has a fax machine, fixed line telephone, and point of sale machine onsite. There is no Internet access in the store. There is a paper-based guest book in the store for potential customers. Customers can write in information and the owner will contact them by the phone number they leave.

Most of the time, the owner conducts business by phone. The owner is very afraid of using the Internet technology since she thought it was hard for her to learn, and she did not think the Internet could help communicate with customers. There is very limited information she provides through the website. According to the interview, the owner of the store witnesses that customers are shifting their information-seeking from the Yellow Pages to Google and Facebook.

The store has always suffered from shoplifting due to the lack of funding and employees. The owner could not fully control the space of the store. Interestingly, the owner installed a faked camera in the middle of the store, hoping it would deter the thefts.

The owner does not know how to seek the support from the government or other organizations.

*Intervention with N1*

The following paragraphs describe the interventions that were carried out for N1:

Fully Utilize eBay and other B2B channels: Owner does not know how to place orders online. At this moment, the only channel that owner places order is through the yellow pages. The owner will check the product from the catalog book, and then places the order via phone. Not only is it inefficient, but also the owner cannot usually get a good price due to the lack of competition. E-Commerce appears to be an efficient way to help the owner reduce the cost. There are different online B2B channels, including eBay, which can provide the owner with high quality products at competitive prices. Setting up account on eBay and walking through the purchasing processes with the owner is the first priority of the IT interventions.

Establish Cloud Based Service For Customer Relationship Management: The owner's son operates the Facebook account for the store. Since there is no Internet available in the store, the only way to keep the indoor customer information is to ask them leave their information in the guestbook. Information like names, email addresses, and interests will be recorded. The owner or her son will then manually type that information into the computer. Promotion information will then be sent to their email addresses. On the other hand, fans on Facebooks will receive promotion information on the homepage of the store. Keeping information from email promotion consistent with Facebook promotion becomes the second challenge for the owner and store. A cloud based service for maintaining customer relationship is the second step of the IT interventions.

### *Observations*

Following is a description of the observations made in N1 as the interventions were being carried out. The IT interventions were conducted at owner's store. Over the course of three visits, the IT interventions were conducted during business hours so sometimes the interventions had to be paused.

The first intervention includes the introduction of the process and potential benefit of the IT interventions. The owner of PI appeared very open to the technologies. She also mentioned that she had tried different channels to advertise products. She had tried to advertise on TV and newspaper. However, they were very expensive. She also tried the advertisement service that Google and Facebook offered. However, she did not know how effective those advertisements were.

The second intervention include an official video from eBay to help the owner understand the basic function of eBay, the process of placing an order, tracking the order, and other key steps in utilizing the B2B service. After the second intervention, Google docs was introduced as a cloud based service to help owner sync customer information even when there was no Internet connection. Google docs allows customers to type the information into the computer, rather than writing them down on the guest book. By doing so, owner was able to keep the same pace on the promotion information with customers indoor and customers/fans on Facebook account. Owner of N1 was very excited about that service since it was free. Overall, the training with the owner went smoothly.

### *Outcomes*

Following are the outcomes of the impact that the IT interventions created in N1.

Overcame fear of technology cost: The fear of technology cost was heavily observed during the intervention. Owner was not willing to use premium charged service like Dropbox Business since she had very limited budget in Technology. She also had bad experiences with previous purchases of advertisement service. Thus, all the service we provided were free of charge. By doing so it helped owner overcome the fear of technology cost.

Eagerness to learn: Owner was very friendly, humble, and eager to learn the technologies. Besides the training, the owner showed her smart phone, and asked how to use the mobile applications to connect with customers.

### **Native American Business-N2**

N2 is a Native American owned micro-enterprise in a small city adjacent to the metropolitan area. The company provides different Native American gift services, including Native jewelry, artifacts, and Minnetonka moccasins. The owner of the store is a middle-age Native American woman. The store is highly engaged with the local Native community. Twice weekly, the store offers Native American embroidery courses. Serving as an information hub for the local communities, regular customers contribute to the majority of the sales.

The store faces shoplifting challenges due to the lack of employees. However, the owner is willing to invest in alarms, cameras, and monitors. The usage of those IT related devices greatly reduces the issue. The owner purchased a personal computer and an iPad to better control the stock of the store. There is no website for the store. But the owner does have two Facebook pages to better communicate with the customers and local communities.

### *Intervention with N2*

The owner of N2 was not willing to accept new technologies since she considered the existing technologies were sufficient. She spent about \$1000 for the alarms, cameras, and monitors. However, she was not willing to accept new technologies even some of the cloud based service were free. As the solo owner of the store, she could have invested her time and resources in some free technologies and service like Dropbox and Skype. But after she purchased the iPad and personal computer, she was not willing to further utilize the service.

### *Observations*

Two visits were conducted to N2. The first visit provided the owner an overview of the existing technologies she had, and identified several potential services and technologies for future considerations. The second visit further identified different services that can be applied to RI in the future.

### *Outcomes*

Cloud based service was not carried out during the two visits. However, according to the observations, N2 is highly connected to the local community. Cloud based service might be appropriate for future consideration.

### **Native American Business-N3**

N3 is a Native American owned small business in a medium size city of the metropolitan area. They serve over 90 tribal and Native American health service clinics in 15 states. Founded in 1993, the store provides a full service, discount eyeglass program.



The owner of this business is a Native American in his 60s. Usually he sends and receives email via a smart phone and desktop to remotely communicate with other employees. Since most of the business and transactions are conducted offline, the owner does not need to worry about information security issues. The owner has a website to demonstrate the product online, it is also outsourced to a third party.

According to the interview and observation, the owner was very open to the use of information technology. He outsources the majority of the IT-related work since he is not familiar with infrastructure and information security. The owner also has a smart phone that helps him communicate. However, he finds it extremely difficult to use the smart phone. During the initial meeting, he was only able to make phone calls to business partners. He did not know how to send text message, check email, and check documents from the smart phone. The owner has very limited knowledge of cloud based service such as Dropbox and Skype. He also expressed the need for fully utilizing the functions and features provided by the smart phone. Limited knowledge hinders the development of the micro-enterprises since he could not get updated information if he does not have access to his office computer.

#### *Intervention with N3*

The following paragraphs describe the interventions that were carried out for N3:

Fully Utilize Smart Phone: The only function of the smart phone that owner utilizes is making phone calls. The owner has very limited knowledge in sending text messages to employees from the smart phone. Owner does not know how to receive/send emails, or utilize other cloud based service.

Establish Cloud Based Service For Communication: Skype and iMessage. N3 owner wants to utilize cloud based services so that he can connect with his employees and other business partners when he is traveling. Even though most of the business and transactions are processed offline in distributed locations, it becomes essential for the owner to take advantage of the cloud based service to communicate with others. During the interventions, the owner expressed that it would be great if he could choose to use the service for free. Skype is identified as the first appropriate cloud based service as it provides both desktop and smart phone version at no cost. iMessage is identified as the second cloud based service for communication as owner can send and receive message via smart phone at no extra cost.

Establish Cloud Based Service For Data Sharing: DropBox can be a powerful tool for micro-enterprise and it was identified during the intervention as appropriate technology for N3. Currently the owner of N3 relies heavily on document sending via email and has difficulty managing and sharing different versions of the documents like contracts and receipts. Dropbox provides web version, desktop version, and smart phone version for business owners. The drag and drop feature provides additional ease of use and does not require IT knowledge and appears to be a good fit for the micro-enterprise.

Research a method to manage contacts in the smartphone: The owner has about 300 contacts in the smart phone and does not know how to identify and backup this information. iCloud was identified as free service so that owner can backup those contacts information. The owner of TC can also restore all contacts information from iCloud if the smart phone is lost. Owner does not know how to quickly identify and search for a specific contact in

the list by using alphabetical order built in the smart phone. Training for managing contacts in the smartphone is identified necessary for this micro-enterprise.

### *Observations*

The owner of N3 was passionate about those interventions at first. After the first intervention, which was conducted at owner's office, the initial need was identified and further explained to the owner. The first intervention identified different types of available cloud based service and several recommendations for optimizing the smartphone. He appeared to be very satisfied about the interventions and asked for a second intervention.

The second intervention was conducted at researchers' office where both Dropbox and Skype accounts were created. After signing up for both service, basic training was provided to further help owner get familiar with both service. Owner was able to upload the documents and pictures to Dropbox and to use Skype.

Training section for managing contacts in the smartphone was conducted during the second intervention. Researchers spent about 45 minutes to help N3 owner understand basic features in the smartphone and different ways to back up the smartphone. He really liked the training since originally he had to visit the service provider and take a training course at extra fees in order to get familiar with those features.

### *Outcomes*

Following are the outcomes of the impact that the IT interventions created in N3.

Overcame fear of technology: During smart phone intervention, N3 owner demonstrated that he was able to overcome the fear of technology that he had to operate the smartphone. He was afraid he would break the phone and have to spend a lot of money

to get it fixed. However, after the intervention, he appeared to be very confident about the smartphone and different cloud based services.

Eagerness to learn: From the first session, N3 was always eager to learn. N3 requested a second training after the first session.

Improved attitude towards IT adoption lead to IT acquisition: After N3 was able to fully utilize the smartphone, he became more positive towards using the technology. At the beginning of the interview, the owner did not think that IT could improve the business. However, after the second intervention, N3 believed that IT adoption not only leads to better business performance, but also the empowerment of his own life.

#### **Native American Business-N4**

N4 began in 1992 selling toothpaste, towels, and concrete barriers to the federal government. It wasn't until 1995 with the passage of the Federal Acquisition Streamlining Act that the sale of meat and frozen meat products became the dominant sales product for N4. N4 started manufacturing meat products in a local plant and soon expanded sales.

N4 gains an advantage in the bidding process by pledging to purchase a percentage of the total contract from small disadvantaged businesses. Another advantage that N4 experiences is that they are a Small Disadvantaged Business due to owner's status as a Native American. He is an enrolled member of the Cheyenne River Sioux Tribe of Eagle Butte, South Dakota.

N3 and N4 are owned by the same Native American. Currently he has a website outsourced to a third party. The owner of the store does not emphasize a lot on the advertising on the Internet since he said "you cannot taste the meat online". On the other

hand, as one of the wholesalers in the industry, he focuses a lot on offline promotion for the product.

### **African American Business-A1**

Located in a predominantly African American neighborhood with some of the highest child poverty rates in the country, this micro-enterprise is a family owned restaurant famous in the area for its food. The facility is not well maintained, since the owner does not spend a lot for the rent. The restaurant is difficult to locate and does not have clear signage for customer parking. Of the three employees, two were middle-aged African Americans and the third employee was a young African American male.

The owner was defensive during the interview. The owner uses a credit card machine for business as well as a fixed line phone to reach customers. The owner does not use other advanced technology. The computer is only used for personal purposes. The majority of the customers come from the local neighborhood. Potential customers from other parts of the city are not willing to dine at this restaurant because the area is perceived unsafe. This micro-enterprise was highly embedded into the local culture, community, and environment.

### **African American Business-A2**

A2 is a used car dealer from the southern part of Omaha. Currently there are two employees in the store. The owner is an African American in his middle age. The other one is the owner's son. Both have college degrees. According to the owner, the car dealership requires a lot of technology that supports information retrieval. First, they need to upload the profile of the pre-owned car to the database. Second, in order to connect to the

administration of the car dealership, they need to have the fax machine and print machine in the office. Third, in order to persuade the customers, they need an Internet connection to the popular car price database like Kelley Blue Book (KBB) to get information about price. Also, they need to connect to the third party provider to get the repair history report about the car. However, neither of the employees is familiar with the information technology. There is only one computer in the office. The computer is 6 years old and is running Windows XP. The RAM is 1GB, which makes the computer slow. Neither of the employees knew how to adjust the resolution of the computer screen. The business owner is willing to invest money in technology. However, they do not trust information technology. They are fearful of replacing the old computer with a new computer because they think they will lose all the data in the computer. Also, they think they have to invest additional time to get accustomed to the new computer.

## CHAPTER 6: COMPARATIVE CASE ANALYSIS

### Comparative analysis between C1 and CA2

Small business' ICT adoption in China will be less than that of the United States. Small businesses in Nebraska have access to more advanced technology than small businesses in Sichuan. There are obvious differences in the factors pertaining to small business ITC adoption. The following table describes these differences as well as some similarities:

**Table 14. Comparison of the two cases in Nebraska and Sichuan in the model**

	Case in China	Case in the United States
Environment: Internal and External	External costs high and employees paid low wages. Low education of the employees. Policy restricts use of credit card machines	External costs are lower and employees paid higher wages. High education level with certification of particular technology
Technology	Simple Technology	Advanced Technology
Organization	Small number of employees	Small number of employees
Technology adoption- Perceived Usefulness	Telephone is crucial since this is the only way to connect with the external environment. The two-way radio reduces the waiting time. The Wi-Fi connection only contributes to the customers, instead the use by the communication of employees.	The telephone servers as the supplement. Website, and Credit Card Machine and personal computer are the most important technology. Database Management System, Customer Relationship Management Software, and Online Accounting System provide the potential value in the long term.
Technology adoption- Perceived Ease of Use	The telephone and two-way radio are suitable for the employees with low education. Wi-Fi is easy for the customers to use.	Telephone, Fax machine, Website, and Credit Card Machine are easy to use. Electronic Ordering System, Personal Computer, Database Management System, Customer Relationship Management Software, and Online Accounting System are easy to use with knowledge and training. Wi-Fi is easy for the customers to use.
Technology adoption- Perceived Cost	Comparing to the small business in Nebraska, the cost is low.	Comparing to the small business in Sichuan, the cost is high.
Development Outcome	Lower revenue and income	High revenue and income

There are differences in ICT adoption between the two small businesses. These different adoption levels lead the two companies to two different revenue levels. When answering the first research question, one identifies the lack of worker knowledge and education, the fear of the technology, the low salary, the high cost of ICT fees, and the regulation on the usage of ICT limits, and detrimentally affects ICT adoption in China. The increased knowledge and skill of the employees, the comparatively high salary, the low cost of the ICT and the freedom of usage of the ICT encourage and supplement ICT adoption in the United States.

The first important factor is the cultural differences in usage of ICT. Customers from China prefer cash to credit cards. Second is the education level of the employees. In the two cases, the employees in the United States had a greater working knowledge and more adept ICT skills than the employees in China. The third one is the proper choice of technology. In both cases, the small business owners chose the proper ICT to meet their current needs in a low cost way.

### **Comparative analysis between A1, CA1, CA2, C1, C2, and C3**

The open coding illustrates that there are a few differences between adoption of ICTs in small businesses in the USA and China. A total for each of the labels is provided in the following sections and where needed, theoretical sampling is carried out to enhance the categories. A total of 56 labels were arrived at and found to occur in the transcripts 65 times. The results suggest that small business' ICTs adoption in China are less than in the United States. Small businesses in Nebraska have access to more advanced technology than small business in Sichuan and Zhejiang. There are differences in ICTs adoption between



the two small businesses. These different adoption levels lead the two sets of businesses to two different revenue levels.

When answering the research question, “How can ICTs adoption in small businesses in the USA and China bring about sustainable development?”, we identify the following challenges: the lack of worker knowledge and education, the fear of the technology, the low salary rate, the high cost of ICTs fees, and the regulation on the usage of ICTs limits, and detrimentally affect ICTs adoption in China. The increased knowledge and skill of the employees, the comparatively high salary, the low cost of the ICTs and the freedom of the usage of the ICTs encourage and supplement ICTs adoption in the United States.

In the group of business in US, more than half the labels indicate the importance of high perceived usefulness. That indicates the businesses in US in two cases know the importance of information technology. Both high perceived usefulness and low perceived usefulness is observed. Close quantity of labels in high perceived usefulness and low perceived usefulness are found in table 15 below.

**Table 15. Results from Small businesses in the USA**

Category	Frequency	Percentage	Labels
Organization	4	15.4%	Long History (4), Highly educated employees (2)
External Environment	4	15.4%	Mixed customers(1), Acceptable cost in IT(1), low trust to outside people(1), underserved(1)
Internal Environment	2	7.7%	Friendly(1)
High Perceived Usefulness	12	46.2%	IT usage from Neighbor (1) Investment in IT (3) IT adoption (7) IT Worth the value (1),
Low Perceived Usefulness	3	11.5%	System is not durable(1) Low trust in IT professionals(1) Computer not for business use(1)

Social Embeddedness	1	3.8%	Customers from neighborhood(1)
Total	26	100%	

In the second group of small businesses in China, organization and high perceived usefulness are the most important factors. Close quantity of labels in environment and low perceived usefulness are found in table 16 below. Social Embeddedness is also observed in this group. It is clear that these businesses have a greater set of challenges to overcome, such as the cost of technology, language, education and IT skills of employees, and greater reliance on social contacts and word of mouth for customers.

**Table 16. Results from Small businesses in China**

Category	Frequency	Percentage	Labels
Organization	11	19.6%	Long history(1), high education (1), profitable (1), students customers (1) Low educated employees (1), high age employees (1), limited work ability(1), Not enough experience in IT (1), More time (2) Employees do not know how to use IT (1), not too comfortable to use the IT (1)
External Environment	12	21.4%	high rent (1) prefer cash payment (1) License for business (1), additional fee (1), high cost of IT(4) International trade (1), foreign customers (1) Customers do not need knowledge in IT (1), do not communicate on Internet (1)
Internal Environment	5	8.9%	High requirement of English (1), young graduate employees (1), senior managers (1) Employees do not know how to use computer, low educated employees,
High Perceived Usefulness	23	41.1%	telephone (4) Two-way radio (1). IT saves time (7), quick response(1),. Wi-Fi connection (1), Internet (2) Willing to use IT (1), computers (2), online business (1), fax machine (2), Chinese and English website (1),
Low Perceived Usefulness	3	5.4%	low incentive to use IT (1), Low trust in IT (1), Tried the software before not useful at all (1)
Social Embeddedness	2	3.6%	important address (1) word of mouth (1)
<b>Total</b>	<b>56</b>	<b>100%</b>	

While the categories remain the same, there are differences in ICTs adoption in the small businesses of both countries. The small businesses in US will more easily get the higher quality of employees. According to the six cases, the employees in US will have better education background and knowledge. Cost expertise, education will be the common concerns in both models.

However, the social embeddedness is added into group 2 small businesses in China. The small businesses in China are different from the ones in the United States. They are strongly connected with the particular social structure, even though it received debates about the positive and negative effects on the economic behavior. While small businesses owners are not able to promote the business by the ICTs, social embeddedness plays a more important role. Besides that, external and internal environment in each country will be different. In China, the administrative fees for usage of ICTs will be much higher than in the United States. The differences in both external and internal environments result different levels of ICTs adoption in the two areas.

### **Comparative analysis between N1, A1, and A2**

Data gathered from three cases (N1, A1, A2) were analyzed using the model by Qureshi and Lamsam (2008) to arrive at instances of the categories in their model. These results are depicted in the Table 17 below:

**Table 17. Digital Divide Aspects Effecting Micro-enterprise Sustainability**

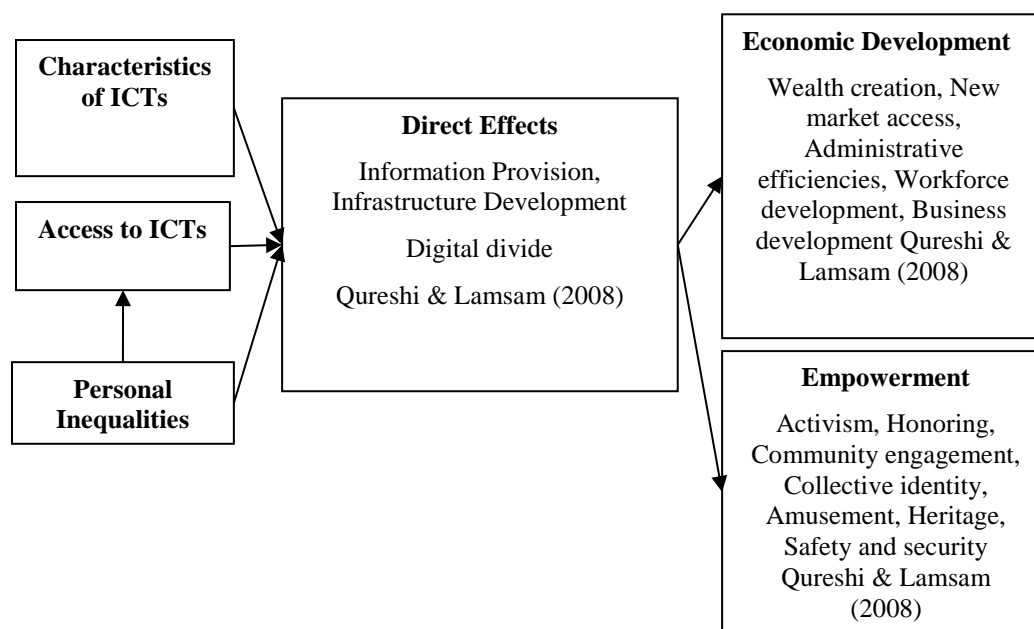
	<b>Native American Business-N1</b>	<b>African American Business-A1</b>	<b>African American Business-A2</b>
<b>Characteristics of ICTs</b>	Basic ICTs	Very Basic and Simple ICTs	High ICTs
<b>Access to ICTs</b>	Limited	Very Limited	Easy
<b>Personal Inequalities</b>	Education, Knowledge, Insufficient Funding	Education, Knowledge, Funding	High Education, Knowledge, Funding
<b>Direct Effects</b>	Low Information Provision	Low Information Provision	High Information Provision
<b>Economic Development</b>	Median wealth creation, limited access to new customers, low business development	Median wealth creation, very limited access to new customers, low business development	Median wealth creation, high access to new customers, high development
<b>Empowerment</b>	High Honoring, High Community engagement	High Honoring, High Community engagement	Media Honoring, High Community engagement

According to the model, we can see the characteristics of ICTs could directly lead to the direct effects of information provision and infrastructure development. According to the results, people are more likely to adopt easy ICTs, such as TV, credit card machine compared to a personal computer, CRM software, and other advanced tools. This is also suggested in the study by Xiong & Qureshi (2012).

Personal inequalities could lead to different performance on the access to ICTs. According to the interviews, African Americans and Native Americans are less likely to have access to ICTs. While access to ICTs could lead to the direct effects of information provision and infrastructure development, personal inequalities could also lead to different performance of direct effects.

The use of ICTs and new media has implications for the economic development and empowerment. It appears that those micro-enterprises we interviewed are highly

connected to the nearby community and neighborhood. A majority of the customers come from friends in the communities as well as by word of mouth. If they could adopt appropriate ICTs, they could potentially expand the local markets. This has implications for the way in which micro-enterprise owners are able to survive through the digital divide. Below, we add the three concepts uncovered through the analysis of our data.



**Figure 6. Research model of the effects of ICTs on the Digital Divide of Micro-Enterprise**

The above model contributes to the intersection of two trends in information technology for development: the growing role of micro- and small enterprises (MSEs) and the use of information and communication technologies (Duncombe & Heeks, 2002).

## CHAPTER 7: CROSS DATA ANALYSIS AND RESULTS

Chapter 7 addresses research question 3, which is *What aspects of digital divide are preventing small businesses from sustaining themselves between different ethnic groups?* and research question 4, *How can ICTs support the development of small businesses?*

### Stage 2-Survey Analysis

Since the growth of an emerging economy such as China is being powered by ICTs, this research investigates the factors that affect the adoption of ICT by small businesses in China? Following an analysis of data collected from 118 small businesses in a high growth province and a largely rural province, this paper arrives at a set of factors that affect the acceptance of ICT in China and their outcomes on small business development. Then multiple regression is carried out to test two hypotheses to analyze the relationship between the UTAUT variables and ICT usage, and the effect of ICT usage and Human Capital in the Development of Small businesses in China. In this study, the construct of development is considered as a measure of growth of small businesses. Our structural equation modeling (SEM) showed that Usage of ICT (BI) and Human Capital (TEE) have a positive effect on the Development of Small Business (APPP) giving us strong support for our theoretical model. The theoretical contributions of this research are threefold: first, we show which technology acceptance factors affect ICT usage in a unique context, that of small businesses in China; second, we add to the IT acceptance theories by measuring an outcome of ICT adoption in terms of an economic development variable; and we measure the effects of human capital on ICT usage. This theoretical model and the combination of variables and their relationships tested, to the best of our knowledge, have not been studied at this time and add to the literature on IT acceptance.

In this dissertation, a series of statistical analyses, including factor analysis and SEM were conducted to answer the hypothesis and research question. In this section, the discussion of survey participants, research setting, instrument administration, and research results is provided. Factor analysis is applied to investigate the relationship between several factors that adopted from UTAUT model and the usage of ICT. Structural Equation Modeling is applied to further investigate the relationship between usage of ICT, human capital and the development of small business.

### **Research Setting and Data Collection**

The quantitative phase of the current research focuses on empirically testing our research model from newly gathered data. There are 118 small businesses in Zhejiang Province and Sichuan Province involved in the survey. There are two parts of the survey, which are ICT related and E-Commerce related. In this paper, we will use the ICT related survey. The survey was translated from English to Chinese and then translated to English again to make sure the meaning of each question did not change during translation. There are three parts of the survey. Section A: Basic Information- provides the basic information of small business. Section B: Survey questions- provides opportunity for small business owners to answer the 7- point scale survey. Table 13 provides the characteristics of small businesses.

**Table 18: The Characteristics of Small Businesses**

	<b>Zhejiang</b>	<b>Sichuan</b>
Number of Small Business	53 (45%)	37 (31%)
Number of Startup	20 (17%)	8 (7%)
Average Number of Employees	5.51	5.71
Average Spent on Training and Education Per Employee (USD)	166.14	170.76
Average Profit Per Employee (USD)	16636.68	15970.91

The subject of the survey is the assessment of the small business owners' usage of ICT, human capital, and the development of small businesses. ICT in this research is defined as Appropriate Technology. According to Schumacher (1989) Appropriate Technology is defined as the "The acquisition of technology appropriate for the small businesses' economic environment". In this definition, ICT is used in a very broad sense. For example, the technology could be something as simple as corded, landline, telephones. It could also include basic mobile phones, and radios in the developing countries. In more advanced areas technology is an online billing system, an iPad ordering system, and a Near Field Communication (NFC) payment system.

### **Statistical Analysis in Stage 2**

Data was gathered via survey from different small businesses in two provinces in China. Survey was distributed to 180 small businesses. Overall, with a response rate of 65.56%, data from 118 small businesses were gathered. We use the seven-point scale survey, and nine factors are identified according to the survey. The development of small business is measured through the mean value of Annual Profit Per Person (APPP), and Annual Cost on Training and Education Per Person (TEE). The value for these variables is higher compared to the other variables because the other variables are measured in a 1-7 scale while the APPP and TEE is measured directly through the annual profit per person in USD. As we can see, the mean of BI, ATT, PU, FC, AX, PEU, and JF are all higher than 4. While in the survey, the lower the score, the less unlikely small business is willing to use the ICT. All Descriptive Statistics of the Sample are described in Table 19. We found that the UTAUT model was only partially supported. Perceived usefulness (PU), Perceived ease of use (PEU), Social influence (SI), Facilitating conditions (FC), Attitude toward



using technology (ATT), Self-Efficacy (SE), and Anxiety (AX) were thought to be potentially important determinants of the behavioral intention to use the system. However, this was not the case in this research.

**Table 19. Descriptive Statistics**

	N	Mean	Std. Deviation	Coefficient of Variation
BI	118	4.44	1.159	26.10%
TEE*	118	167.90	184.572	109.93%
APPP*	118	16382.79	16806.694	102.59%
ATT	118	4.4047	1.09920	24.96%
PU	118	5.115254	1.1765244	23.00%
FC	118	4.3136	1.03682	24.04%
AU	118	4.316384	1.0911432	25.28%
PEU	118	4.450847	1.1217162	25.20%
PE	118	4.3771	1.04990	23.99%
Valid N (list wise)	118			

\* These variables are measured by USD; other variables are measured by 1-7 scale.

Furthermore, following Riemenschneider et al. (2003), we found the “collected” could help us understand the IT adoption decision better comparing to the traditional TPB or TAM. We use UTAUT instead and found the Human capital together with the ICT usage could support the sustainable development. The following sections illustrate the data analysis.

### **Construct Validity**

Factor analysis is applied to derive a relatively small number of components that can account for the variability found in a relatively large number of measures. Factor analysis searches for such joint variations in response to unobserved latent variables. Factor analysis was conducted to understand variability among observed, correlated variables, which include Perceived usefulness (PU), Perceived ease of use (PEU), Facilitating conditions (FC), Attitude toward using technology (ATT), Job-Fit (JF), and Anxiety (AX) in the survey. They are identified as the most important factors in the model. Summarily,

this analysis confirms the validity analysis of the UTAUT model by showing strong correlation for most items belonging to the same construct.

### Factor Loading

Then, correlation among constructs was examined to ensure that the constructs represent the factors arrived at. The factor loading for scale items based on the VARIMAX rotation are analyzed. Perceived usefulness (PU) (0.811), Facilitating conditions (FC) (0.7474), Perceived ease of use (PEU) (0.6818), Attitude toward using technology (ATT) (0.7), Job-Fit (JF) (0.68425), and Anxiety (AX) (0.738) are identified as key factors that affect the adoption of ICT. As there was no factor loading for SI and SE, they were excluded from the analysis. Most of the remaining items represented good convergent and discriminant properties. Thirty items are divided into six constructs. Overall, the constructs developed by Venkatesh et al. (2003) fared well in this replication, even though they were based on different samples and context settings. This is vital because it indicates the general applicability of these constructs for different types of research questions. Summarily, this analysis confirms the validity analysis of the UTAUT model by showing strong correlation for most items belonging to the same construct. These are illustrated in the following table 20:

**Table 20. Cumulative Initial Eigenvalues**

	Perceived Usefulness	Facilitating Conditions	Perceived Ease of use	Attitude toward using technology	Job-Fit	Anxiety
E.Value	16.553	1.785	1.058	.955	.808	.697
% of Variance	66.131	7.140	4.230	3.820	3.233	2.788
Cumulative %	66.131	73.271	77.501	81.321	84.554	87.342

We found that the UTAUT model was only partially supported by our analysis. Perceived usefulness (PU), Perceived ease of use (PEU), Social influence (SI), Facilitating conditions (FC), Attitude toward using technology (ATT), Self-Efficacy (SE), and Anxiety (AX) were important determinants of the behavioral intention to use the system. However, this was not the case in this research. Only two factors were supported these were: Perceived Usefulness and Facilitating Conditions.

Our factor analysis showed that Attitude toward using technology, Perceived Usefulness, Facilitating Conditions, Anxiety, Perceived Ease of use are related to the adoption of ICT. Also, according to initial eigenvalues, the first six components can explain the 87.342% of the whole model. The attitude toward using technology plays the most important role in the whole model. According to Table 20 the perceived usefulness could explain 66.131% the model among all the factors. In sum, the attitude toward using technology is playing the most important part between the different factors. Table 21 provides an overview of factor loading.

Table 21. Factor loading

		Component						Communalities
		Perceived Usefulness	Facilitating Conditions	Perceived Ease of use	Attitude toward using technology	Job-Fit	Anxiety	
Perceived Usefulness	PU-1	<b>0.829</b>	0.200	0.241	0.212	0.202	0.197	.910
Perceived Usefulness	PU-2	<b>0.818</b>	0.215	0.331	0.232	0.135	0.128	.013
Perceived Usefulness	PU-3	<b>0.851</b>	0.192	0.202	0.233	0.167	0.194	.922
Perceived Usefulness	PU-4	<b>0.847</b>	0.201	0.206	0.260	0.188	0.086	.910
Perceived Usefulness	PU-5	<b>0.710</b>	0.162	0.273	0.250	0.359	0.191	.832
Perceived Ease of Use	PEU-1	0.346	0.270	<b>0.712</b>	0.239	0.289	0.197	.880
Perceived Ease of Use	PEU-2	0.325	0.273	<b>0.726</b>	0.234	0.222	0.263	.881
Perceived Ease of Use	PEU-3	0.328	0.322	<b>0.747</b>	0.199	0.154	0.245	.893
Perceived Ease of Use	PEU-4	0.369	0.294	<b>0.603</b>	0.348	0.325	0.168	.841
Perceived Ease of Use	PEU-5	0.355	0.219	<b>0.616</b>	0.258	0.339	0.339	.850
Job-Fit	JF-1	0.211	0.330	0.321	0.297	<b>0.650</b>	0.238	.824
Job-Fit	JF-2	0.245	0.166	0.216	0.297	<b>0.764</b>	0.263	.876
Job-Fit	JF-3	0.282	0.336	0.235	0.288	<b>0.689</b>	0.196	.844
Job-Fit	JF-4	0.350	0.355	0.269	0.191	<b>0.634</b>	0.294	.846
Attitude toward using technology	ATT-1	0.344	0.284	0.159	<b>0.681</b>	0.349	0.269	.883
Attitude toward using technology	ATT-2	0.290	0.167	0.303	<b>0.786</b>	0.229	0.182	.906
Attitude toward using technology	ATT-3	0.330	0.291	0.251	<b>0.758</b>	0.265	0.148	.924
Attitude toward using technology	ATT-4	0.425	0.293	0.235	<b>0.659</b>	0.246	0.182	.850
Facilitating Conditions	FC-1	0.185	<b>0.797</b>	0.234	0.122	0.252	0.236	.858
Facilitating Conditions	FC-2	0.206	<b>0.815</b>	0.227	0.196	0.201	0.226	.887
Facilitating Conditions	FC-3	0.240	<b>0.733</b>	0.272	0.228	0.253	0.273	.859
Facilitating Conditions	FC-4	0.251	<b>0.682</b>	0.209	0.366	0.160	0.195	.768
Anxiety	AX-1	0.197	0.304	0.319	0.251	0.263	<b>0.722</b>	.886
Anxiety	AX-2	0.256	0.407	0.229	0.288	0.222	<b>0.688</b>	.888
Anxiety	AX-3	0.188	0.279	0.239	0.123	0.271	<b>0.804</b>	.904
E. Value		16.553	1.785	1.058	.955	.808	.697	
Cronbach's alpha		0.976	0.957	0.935	0.955	0.940	0.932	

Extraction Method: Principal Component Analysis

Value less than .603 is not significant and only the significant values have been highlighted.

### Assessment of Correlation

To test the hypotheses, AMOS was used to conduct structural equation modeling (SEM). Based on the earlier validity analysis, PU, FC, PEU, ATT, JF, and AX were thought

to be important determinants of the behavioral intention to use the ICT. According to the result, Facilitating conditions (.013\*\*\*) and Attitude toward using technology (ATT) (.000\*\*\*) are correlated to the use of ICT. This means that when small business owners find the technology easy to use and have a positive attitude to it, they will use the technology. However, Perceived ease of use, Perceived Usefulness, Job Fit, Facilitating Condition (cost) and Anxiety were not supported. Table 22 provides detailed information on the regression weights of the model.

**Table 22. Regression Weights of the Model**

			Estimate	S.E.	C.R.	P
BI	<---	PU	-.021	.055	-.376	.707
BI	<---	JF	-.017	.059	-.282	.778
BI	<---	PEU	.052	.058	.904	.366
BI	<---	FC	.155	.063	2.474	***
BI	<---	ATT	.430	.059	7.291	***
BI	<---	AX	.338	.062	5.479	***
APPP	<---	BI	1962.444	1088.954	1.802	.072
APPP	<---	TEE	63.324	5.506	11.500	***

\*\*\* is significant at the 0.001 level, \*\* is significant at the 0.01 level, \* is significant at the 0.1 level

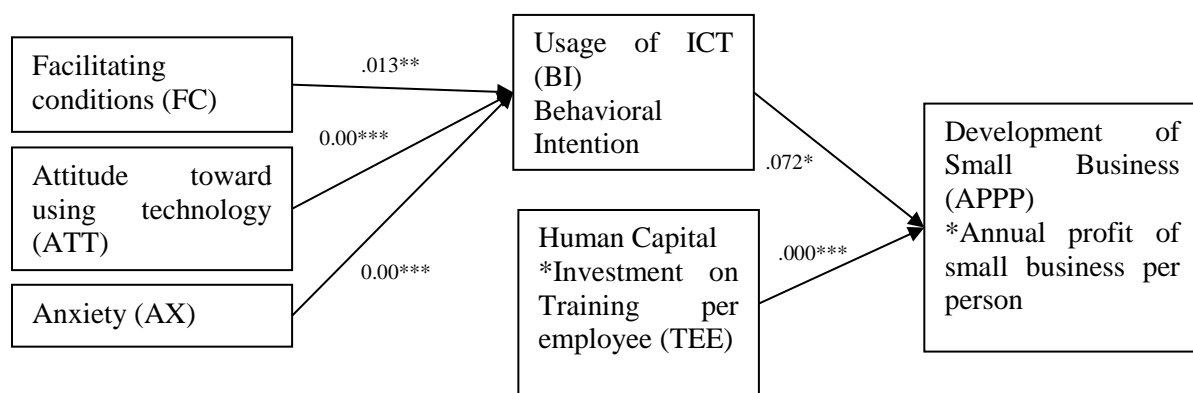
Also, we identify Usage of ICT (BI) and Human Capital (TEE) will have positive effect to the Development of Small Business (APPP). We found strong support for our theoretical model, as H2 were supported with high significance based on data collected from N=118 small business owners. H1 below is only partially supported

***H1: Perceived usefulness, Job-Fit, Perceived ease of use, Facilitating conditions, attitude toward using technology, and anxiety will make a positive impact on the usage of ICT.***

At the fourth step of the research, we want to see how much impact the PU and FC make to the development of small business. In order to achieve that, regression is applied to the research.

ATT and PU can directly make impact to the development of small business. Both ATT and PU are significant to the APPP. The high standard error of this data set is due to the differences between the annual profit of small businesses in two areas, and that will not make effect to the result of the analysis. In the next step, we will analyze how human capital can make effect to the development. We find out that both Usage of ICT and Human Capital can play a significant role towards the development of small business, which is measured by the annual profit of small business.

***H2: Usage of ICT and Human Capital will make a positive impact on the Development of Small Business.*** The hypothesis is supported from our data.



\*\*\* Significant at 0.01 \*\* significant at 0.05 \* significant at 0.10

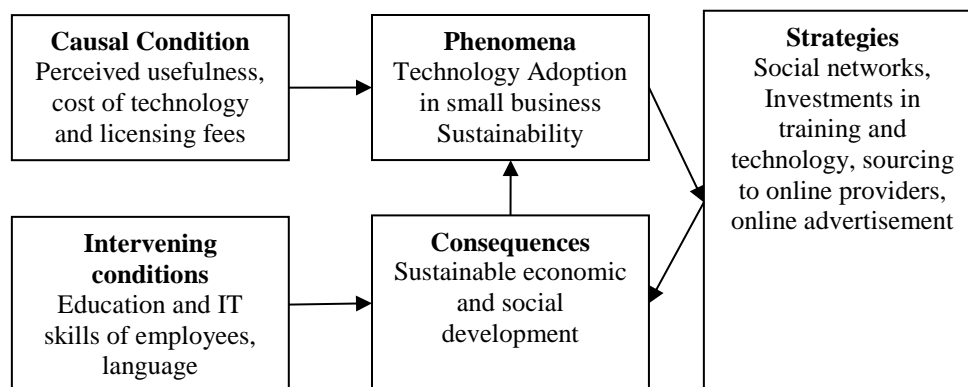
**Figure 7: Revised Research Model in Stage 2**

As shown in the revised research model, facilitating conditions (FC), attitude toward using technology (ATT), and anxiety (AX) are significant and will make a positive

impact into the usage of ICT (BI). Also, the usage of ICT (BI) and human capital are significant and will make a positive effect towards the development of small business (APP). Discussion will be conducted based on the result of factor analysis and SEMs.

### **Revised Research Model-Stage 2**

The second stage of this analysis is axial coding to arrive at a theoretical model. Corbin and Strauss (1990) describe this as relating categories to their subcategories, and the relationships are then tested against data. This entails identifying the Causal Conditions that lead to the main Phenomenon and the Strategies and Context affecting that phenomenon. Through axial coding, we discover the causal conditions leading to the main phenomena of technology adoption and sustainability, that high perceived usefulness is the casual condition leading to the technology adoption phenomenon that lead to strategies such as investments in technology and training that bring about consequences of economic and social development. We also discover the intervening conditions such as the education and IT skills of employees that effect economic and social development. The technology adoption phenomenon brings about strategies in which some small business will choose to invest in IT, some small businesses will choose to invest in training systems. Some companies will outsource the service to third party, e.g., Alibaba.com and Taobao.com. This model is illustrated in figure 8, below:



**Figure 8: Revised Model of Technology Adoption for Sustainable Development in Stage 2**

Achieving sustainable development entails a combination of factors to be in effect. According to the World Bank and the United Nations, sustainable development entails the simultaneous achievement of economic (growth, equity and efficiency), social (empowerment, participation, social mobility, social cohesion, cultural identity and institutional development) and ecological objectives (ecosystem integrity, carrying capacity, biodiversity and protection of global commons) (Vargas, 2000).

Qureshi et al (2008) suggest that in order to sustain improvements in the growth of micro-enterprises, organizational and technical infrastructures are needed to provide technical and business assistance within the community in which the entrepreneurs reside. In order to ensure sustainable development, one must consider the growth of micro-enterprises within the context of a larger development strategy that takes into account the social capital needed to sustain them. Qureshi et al (2008) state that economic improvements in microenterprises can be achieved by growth stimulation, equitable



distribution of resources, and increasing the efficiency of factors of production through the IT training and technology interventions. They state that social objectives can be achieved by empowering owners through participation in social and cultural activities that reinforce their identities. Both of these economic and social objectives need to be addressed if the model presented here is to bring about sustainable development.

Framing has been used in IS as means of identifying the deep structures in ideology and rhetoric related to Information Technology diffusion (Barrett et al., 2013). It is a rhetorical strategy used to identify deep structures of meaning in communication, observable facts, and actions. In this study, framing analysis is used to understand why micro-enterprise owners use technology and how the ICTs they use may support the development of Native American and African American owned micro-enterprises. Although both sets of micro-enterprise owners face similar resource constraints, we expect the framing analysis to shed lights into their unique characteristics and ideologies that influence how their ICT adoption affects the growth of their businesses.

In their framing analysis of Native American newspapers, Qureshi and Lamsam (2008) offered a set of themes and frames. We draw upon these and add to them in our framing analysis of micro-enterprise owners. The main frames identified in the transcripts are:

The main frame for this analysis is Development as defined in the theoretical section as improvements in the lives of people where the use of IT leads to better livelihoods. This frame is also associated with the creation of new opportunities and income generation as a result of interventions, in this case ICT. Within this main frame, the following sub-frames were identified in the transcripts:

1. *Workforce Development* -- increase of productivity of people as a result of training in ICT;
2. *Infrastructure Development* -- provision of technologies, services, and media networks to support the micro-enterprises; and
3. *Community Development* -- use of ICTs to support the creation of shared goals and values as they relate to a group of people, in this case a tribe or nation. Family, friends, and other people who help with the ICT usage.

The coded transcripts revealed labels related to IT perceptions and usage by the micro-enterprise owners. The labels were checked for inter-coder reliability by a second researcher. The labels were categorized into frames and tabulated as depicted in the following Table 23.

**Table 23. Frames of Micro-Enterprises use of ICT**

	<b>Community</b>	<b>Infrastructure</b>	<b>Work Force</b>	<b>Total</b>
<b>N1</b>	9	13	2	<b>24</b>
<b>N2</b>	5	11	9	<b>25</b>
<b>N3</b>	3	7	5	<b>15</b>
<b>N4</b>	4	6	4	<b>14</b>
<b>A1</b>	3		1	<b>4</b>
<b>A2</b>	3	5	2	<b>10</b>
<b>Total</b>	27	42	23	<b>92</b>

The frame for Infrastructure Development has the largest number of occurrences. The Native American owned micro-enterprises (N1, N2, N3, and N4) have access to and make use of a variety of technologies and services for their businesses. Examples of the use of ICTs in the micro-enterprises are as follows:

N1: “I do conduct business by phone. Sometimes people will ask me different questions online. Occasionally I will receive questions about the products via emails. Our website looks good, but I just do not know how many people will visit the website. I use that [FB] greater than anything... Then after that I was so proud that I set up the account by myself. I put history information into the Facebook account.”

The Native American micro-enterprise owner, N1 has the most ICT infrastructure in her micro-enterprise. She also draws upon the assistance of her community members in assisting her with the technology.

N1: “In the past, we did some business online but it was my ex-boyfriend who set that up and I did not earn a lot of money because of that.

“I do have a Facebook home page when my son helped me set that up so that I can communicate with customers. And I was a little bit resistant when my son helped me set up one. But it was great and easy to use.”

“I should use more of that technology in the future since my daughter who was a marketing person was encouraging me to focus on the online marketing. “

This connection between the use of ICTs in a micro-enterprise and community support is also apparent in the other Native American-owned micro-enterprises. It is apparent from the transcripts that the Native American culture is very community oriented and social network technologies are helping the Native American-owned micro-enterprises to connect with their customers and their broader community - hence the high Community Infrastructure scores. This is illustrated in the following:

N2: “I think they [ICTs] are very helpful. I will jump up to Facebook and see what is going on. I stay in the loop of the community so I post things people share within the Native American community.”

Also use Facebook to connect with customers: “My Facebook little page gets about 500 likes and my big page I got over 3000. But I got lost in the big one since I have too many customers.”

Comments relating to the Work Force development frame represent the ability of the micro-enterprise owners to do their work more effectively and efficiently. In some cases, being able to take control of their technology use enabled the Native American micro-entrepreneurs to feel that their business was doing better.

In trying to understand how the ICTs support the development of Native American and African American micro-enterprises, we identified themes. These themes are comprised of labels identified in the framing analysis to relate to how the ICTs helped or hindered the development of the micro-enterprises. These themes are illustrated in table 23 below:

Table 24. Themes of Micro-Enterprise ICT Support for Development

	<b>IT Products &amp; Services</b>	<b>Technology Skills</b>	<b>Business Economic Development</b>	<b>Education Training Career Development</b>	<b>Total</b>
<b>N1</b>	13		2		15
<b>N2</b>	10	6	5		21
<b>N3</b>	7	3	1	2	13
<b>N4</b>		2	1	1	4
<b>A1</b>	1		3		4
<b>A2</b>	4	2		1	7
<b>Total</b>	35	13	12	4	64

Two of the Native American micro-entrepreneurs, N1 and N2, had the most number of IT products and services in use for their businesses. The two African American micro-enterprises, A1 and A2, used the least number of IT products and services for their businesses. The Native American micro-entrepreneurs also had more technology skills than the African American micro-entrepreneurs. It is also interesting to note that of all the micro-entrepreneurs who had pursued Education, Training, and Career Development activities, none (except for N3), had made use of IT Products & Services and Technology Skills in their businesses.

To understand how ICTs affected development of the micro-enterprises, we identified labels relating to the Business Economic Development theme. While the Native American micro-enterprises (N1 and N2) illustrated the largest number of labels in this theme, an African American micro-enterprise (A1) also had a number of occurrences within this theme. Sections of their transcripts relating to Business Economic Development are illustrated as follows:

N2: "I am paying the bills. Haha."

N1: "My sales did go up. But I do not know it is because of the advertisement I purchased, or because of the economy. Back to 2007 and 2008, I almost made twice of the money I can make now."

A1: "Yes, I use the credit card machine. That does help me"

The above analysis shows that the use of IT Products and Services in both Native American and African American micro-enterprises does enable the business to grow. Micro-enterprises owners that have information technology skills, in the case of N2, the business development outcomes in terms of increased sales and economic development outcomes in terms of being able to grow, are greater. Whereas education and career development activities do not seem to enable the micro-enterprises to develop, even in the presence of technology skills, as is the case for A2.

Trust seems to be a key factor in the use of ICTs in African American micro-enterprises. This is illustrated in the following transcripts of African American micro-entrepreneurs:

N2: “Yeah, I am willing to invest in a new computer, but I don’t trust them. You know, they cannot ensure the safety of my data. In the future I am planning to get a new one. But nobody will touch my data. I am going transfer the data by myself.”

A1: “Oh, I do not need Information Technology to help me... People see the news and don’t want to come down here where there are shootings. I don’t know if it [a computer] will really help me improve my business.”

It seems from our analysis so far, that the relative success of Native American micro-enterprises in using ICTs in their businesses has to do with the social networking components that suit their cultural characteristics well. It appears from these findings that the African American micro-enterprises are reluctant to use ICTs in their business because they do not trust the technology or feel that it can be of use for them.

Further research using a larger sample of Native American and African American micro-enterprises would have to be undertaken to test these findings. For the moment, the results of this analysis can be used to provide recommendations as to how ICTs may be used to further support micro-enterprise development.

According to the previous research, Qureshi and Lamsam (2008) provides a set of frames that lead to the understanding of the ICTs and media effects in the digital divide. Based on the Xiong et al. (2014) model, it was identified that the characteristics of ICTs, access to ICTs, personal inequality, direct effects, economic development, and empowerment are the main frames for our research. The coded transcripts reveal labels related to IT perceptions and usage by the micro-enterprise owners. These labels were categorized into frames and tabulated as depicted in the following table 24.

**Table 25. Frames of Micro-Enterprises use of ICT**

	<b>N1</b>	<b>N2</b>	<b>N3</b>	<b>N4</b>	<b>Total</b>	<b>%age of Total</b>
<b>Characteristics of ICTs</b>	13	10	4	5	32	44%
<b>Access to ICTs</b>	4	3	3	2	12	17%
<b>Personal Inequality</b>	3	2	1	1	7	10%
<b>Direct Effects</b>	2	1	3	2	8	11%
<b>Economic Development</b>	1	2	2	2	7	10%
<b>Empowerment</b>	2	1	2	1	6	8%
<b>Total</b>	25	19	15	13	72	100%

It appears that Native American owned micro-enterprises face unique challenges during the adoption of technologies. This section describes these in light of the frames that were identified in the transcripts.

### Characteristics of ICTs

The majority of labels (44%) related to the different characteristics of the technology as they relate to the ways in which it is used to support the business. Examples of the Characteristics of ICTs are as follows:

N1: I do conduct business by phone. Sometimes people will ask me different questions online. .... I do have computer at home, but I do not use that for work. I have a Facebook homepage... We will have some promotion information online.

N2: My Facebook page gets about 500 likes and my big page I got over 3000..., I post things via the computer.

N3/N4: We use Gmail. ...My iPhone is smarter than me. I use that a lot. I really like that a lot. I also do a lot of texting via iPhone. Anyhow it makes my life easy, I spent my whole winter texting to control the business while I was on vacation.

It appears from the transcripts and frames, the characteristics of ICTs will lead to different adoption towards Native American owned micro-enterprises. Social network services like Facebook and Twitter, appears to offer greater accessibility for the Native American micro-enterprise owners. A free email service provider like Gmail with iOS enabled smartphone also provides strong support for the same group.

While there is a divide between the people who can get access to the ICTs and the people who cannot, it is also important to understand the characteristics of ICTs could lead to different access and adoption of technologies. In a study by Xiong and Qureshi (2012), it is identified that the character of the technology would lead to different access to ICTs



between the small businesses in the United States and China. Entrepreneurs should find the suitable ICT and use them properly, in order to better support their businesses. On the other hand, the characteristics of ICTs could be an important factor during the adoption of ICTs.

### **Access to ICTs**

Although 17% of the labels related to the access to ICT's frame, it appears that access was not a problem. The following transcripts illustrate that the micro-entrepreneurs have differing levels of access to ICTs:

N1: I use the credit card machine. I have a fax and fixed line telephone. My son just brought a computer to here. But mostly it is for his work. He has products in my store, and he keeps track of them by using the category in the computer.

N2: Wi-Fi..Several monitors, iPad, and desktop,...I think they are very helpful. I got 4 new [security] cameras.

N3/N4: We have secured server for the pricing, so we are not worried about that. That was outsourced to a third IT person.

While there are a number of technologies available and used by the micro-entrepreneurs, it appears that there may be other factors that affect the level adoption of the technology.

Different levels of access to ICTs could be an important factor during the adoption of ICTs. While there are Native American owned micro-enterprises that can get access to the outsourced IT platform, some African American owned micro-enterprises only have access to ICTs like credit card machine. While there are Native American owned micro-enterprises can place an order on iPad, some African American owned micro-enterprises

only take order by telephone. There are different factors that can lead to different levels of access to ICTs, for example, the personal inequality, including education, digital literacy, and the structure of technology support. Other factor like external environment including government policy would also influence the different levels of accesses of ICTs (Xiong and Qureshi, 2012).

### **Personal Inequality**

There were some inequalities in the ways in which the micro-enterprise owners were able to use the technology to support their business activities. Only 10% of the labels accounted for this frame and are illustrated as follows:

N1: ...But I do not use them [computers]. I am too old and not willing to learn the new technology. I do have computer at home, but I do not use that for work.

N2: I don't have a website. I have done it in the past. But unless you are connected, it is hard to keep update. I am the only person in the store and I have to deal with all kinds of things.

N3/N4: Yes, all my nephews will take care of that [inventory database] I don't need to know that. I am just sort of the speaker. They don't let me touch that since I will mess that up.

To continue the discussion in access to ICTs section, personal inequality would be a factor that was left behind in many IT adoption research. The personal inequality is observed from the transcripts above. Among the four Native American owned micro-enterprises, owner of N1 is not willing to accept the technology. The owner of N2 also believes that it is hard to keep updating the website. According to the transcripts, it is also

observed that the nature of micro-enterprises, i.e. employees fewer than five, could also contribute to the lack of adoption of ICTs and the digital divide. Among the owners of N1 and N3/N4, age can also be a factor that leads to the personal inequality and finally lead to the lack of adoption of ICTs.

### **Economic Development**

The following transcripts in this frame illustrate how the entrepreneurs felt that their businesses grow through their use of the technology:

N2: I am paying the bills.

N3/N4: [The smartphone and desktop] Oh, yes. It helps us grow.

N3: I do, it [Facebook] helped for my business grow so much for my optical business.

N1: I make sales after monthly spiritual gatherings. I have done that couple of times before. This year was the first year I did commercials on TV. ... And I did think that increases the sales. I am also in the yellow pages.

As stated in the literature review, economic development can be viewed as the quantitative and qualitative improvement in the economy. It appears from the transcripts that all the Native American owned micro-enterprise benefit from the usage of ICTs. For example, by using the ICTs, owner of N2 is able to survive. The economic development is also observed from N3 and N4 in terms of the growth and improvement. The ICTs also lead to the increase of the sales from N1.

### **Direct effects**

There is a strong link between the Native American owned micro-enterprises and the local communities. For example, N2 offers Native American embroidery courses for local community twice a week and is an avid social network user.

N2: [Our] Facebook is more connected with the Native community. I have a big page and little page on Facebook, trying to keep up with things with different purposes.

N1: I will also put promotion information on the Facebook. I have a list of products online.

As observed in the transcripts above, the social network provides foundations for better connection with local communities among the Native American micro-enterprise owners. As stated in the literature review, most Native societies tend to be collectivistic rather than individualistic, and entrepreneurialism is associated with the latter. Thus, the strong direct effects of ICTs among the Native American micro-enterprise owners could also be an important factor that could help explain the digital divide among them.

### **Empowerment**

Although only 8% of the labels reflected this frame, the transcripts illustrate how the collectivistic Native American culture permeates the use of technology.

N2: Yes, I post pictures and status. I give feedback when people asking questions about the store and the products. At least they know I have things they need. If you or your friend need them, I can post “hey, yes I have them”.

N1: Then after that I was so proud that I set up the account by myself. I put history information into the Facebook account.

N3/N4: Yes, [taught myself] but till now I still use fingers to operate that [Computer]. It has to be easy to use. Fortunately my business partner is lawyer. She knows how to operate the computer.

The above analysis illustrates, given simple access to internet and devices, that the characteristics of ICTs that enable Native American micro-entrepreneurs to grow and those that support social networking and simple usage.

It appears so far from the transcripts, the collectivistic Native American is a critical factor during the adoption of ICTs. For example, N2's customers mainly come from the local communities. The owner of N1 shares history of micro-enterprise on Facebook account. And owner of N3 and N4 receives additional support from the family member. Among all of the Native American micro-enterprise we interviewed, the strong connection between the family, friends, and local communities is another important factor that would lead to the adoption of ICTs.

## **CHAPTER 8: CONCLUSION, CONTRIBUTIONS, DISCUSSION, AND LIMITATION**

### **Contribution for Stage 1**

The first stage of research explores the relationship between the ICT development in less technologically advanced areas in China and the United States. The first stage suggests that the external environment, internal environment, character of technology, organization, usefulness, ease of use, and the cost of the technology will affect the ICT adoption. Entrepreneurs should find the suitable ICT and use them properly, in order to better support their businesses. In less developed areas, small business owners should try to recruit high knowledge employees. In comparison to more developed areas, it will cost much less to pay a worker at a high knowledge level when you are in a less developed area.

First stage study yielded meaningful results. However, there are some limitations. The validity of the results strongly depends on two specific cases. In the future, we will analyze more cases, and conduct quantitative research based on the small business database to support the existing research.

This research helps scholars from economics, business, and Information Technology understand the current status of the Information Technology Development in both areas. Two case studies are conducted simultaneously, building an understanding of ICT adoption in both areas. This study contributes to and extends an understanding of the driving forces behind the economic growth in these regions as they relate to ICT adoption by small businesses. This research paves the way for the future case studies based on the comparison of more developed areas in China and the United States.

## **Contribution for Stage 2**

The theoretical contributions of this research are: 1) the key factors that affect ICT adoption by small businesses in China have been uncovered: Facilitating conditions (FC), Attitude toward using technology (ATT), and Anxiety (AX) are correlated with the adoption of ICT. 2) The outcomes of ICT adoption are measured by economic development of small businesses by Annual Profit per Person. 3) The human capital construct measured by Annual Cost of Training and Education per Person, adds to theories of IT adoption. The analysis shows that the higher the investment in ICT, the greater the usage of ICT will lead to greater profit, hence development of small businesses in China. This addresses the gap in the literature requiring research between the relationship between ICT and the development of small businesses and adds to the literature on IT adoption.

This research also found that for Chinese small businesses, the human capital is very important when they adopt the technology to their businesses. Human capital started its own revolution in the 1950s and early 1960s with the research of Schultz (1961), Mincer (1958), and Becker and Chiswick (1966). The current era is placing much greater emphasis than before on the importance of knowledge and information to the development of both countries and individuals (Becker, 2011). Human Capital plays an important role in either lowering economic costs or elevating customers' willingness to pay (Porter, 1985). The addition of the human capital factor into the model enables multiple regression to be applied to study how human capital can influence the development of small business as well as the adoption of ICT. These outcomes have not been studied in the IS literature at this time.

### **Contribution for Stage 3**

Based on the interviews from six Native American and African American owned micro-enterprises, this research determined that the characteristics of ICTs, the access to ICTs, and personal inequalities could impact the direct effects of information provision and infrastructure development. Based on the research model developed by Qureshi & Lamsam (2008), we further conclude that the direct effects could lead to economic development and empowerment.

According to the results, people are more likely to adopt easy ICTs, such as TV and credit card machines, compared to a personal computer, CRM software, and other advanced tools. This is also suggested in the study by Xiong and Qureshi (2012).

Personal inequalities could lead to different performance in the access to ICTs. According to the interviews, African Americans and Native Americans are less likely to have access to ICTs.

While access to ICTs could lead to the direct effects of information provision and infrastructure development, personal inequalities could also lead to different performances of direct effects.

As stated in Xiong et al. (2014), the characteristics of ICTs, and personal inequalities could hinder the process of economic development and empowerment. It is important that micro-enterprise owners obtain certain abilities to operate Information Technology, while learning-by-doing could also be beneficial for the sustainable development for the micro-enterprises.



On the other hand, most of the owners did not realize there are multiple external funding and IT training opportunities for them provided by government and other organizations.

Lastly, it appears that micro-enterprises in these cases are highly connected to the nearby community and neighborhood. A majority of the customers come from friends and family in the communities as well as by word of mouth. If appropriate Information Technology can be applied and adopted, they would be able to survive through the digital divide.

It seems from our analysis, the relative success of Native American micro-enterprises is associated not only with the adoption of technologies, but also the strong connections with the local communities. Thus, community engagement becomes a unique and critical factor that was not addressed in the previous model. As a tool of empowerment, the Native American owned micro-enterprises can reach the economic development.

The ICTs pose opportunities for businesses yet their unique characteristics highlight personal inequalities that need to be overcome before the Native American micro-enterprises are able to achieve the direct effects they desire when accessing the ICTs. The direct effects of accessing ICTs lead to empowerment mainly through micro-entrepreneurs' learning to use the technologies to grow their businesses. As found in the above analysis, all the micro-entrepreneurs in our sample experienced business growth through their adoption of technology. Two of the businesses were re-investing profits to purchase and use more ICTs to support this growth – hence bringing about a positive growth cycle for the business.

Our analysis of four Native American owned micro-enterprises identifies the key factors that influence Native American micro-entrepreneurs' adoption of technology. Social community support was essential in enabling the micro-entrepreneurs to overcome their personal inequalities associated with the characteristics of the ICTs. We identify a positive cyclical relationship between these factors that supports the growth of these micro-enterprises.

### **Implications for Research**

The results suggest that the characteristics of ICTs, the access to ICTs, and personal inequalities could hinder the process of economic development and empowerment. Our study yielded meaningful results as to the ways in which micro-enterprise owners will need to use ICTs to sustain themselves. This research helps achieve greater in-depth understanding of the relationships among these factors. Based on the analysis, the mixed method approach is appropriate for understanding how the ICT could impact the development of small businesses, including micro-enterprises in both China and the United States. In the future, more performance related data should be applied on top of data gathered from survey, interview, and case study.

### **Implications for Practice**

#### **Interventions for Training and Technology**

Based on the study, providing training opportunities for small business owners could be critical for the growth of small businesses. However, it is surprising to see that even in one of the most developed countries in the world, there is a lack of IT related training that is available for them. Some business owners were even not aware of training

opportunities provided by the government and local communities. Policymakers may need to consider providing additional support for small business owners to utilize the ICT in the future.

### **Lessons learned and Reflections**

ICT can be a powerful tool only when it is utilized appropriately. While there are applications of advanced ICT like cloud computing and big data, the fit should be posited at the center. ICT must be aligned with the business activity and strategy so that it could further lead to the development. Practitioners will need to focus on the alternative goal of the business strategy, rather than chase the popular applications in IT.

Additional small businesses samples from different geographic locations will be conducted in the future. Also, in the future, it will be necessary to include the data that directly accesses the performance of small business in the future.

### **Limitation**

There are several limitations of the research. First of all, the survey data collected in stage 2 was conducted in China only. In the future, survey will be carried out in the United States and comparative analysis will be conducted in the future. Secondly, more in-depth case analysis will be conducted in the future. Lastly, this study only studies the TAM and UTAUT related research models. In the future, other related research models will be considered.

**Table 26. Summary of Contributions, Conclusion**

Stage	Contribution and Conclusion
1.	The first stage identifies that the external environment, internal environment, character of technology, organization, usefulness, ease of use, and the cost of the technology will affect the ICT adoption.
2.	The second stage of research highlights 1) that the key factors that affect ICT adoption by small businesses in China have been uncovered: Facilitating conditions (FC), Attitude toward using technology (ATT), and Anxiety (AX) are correlated with the adoption of ICT. 2) The outcomes of ICT adoption are measured in terms of the economic development of small businesses in terms of Annual Profit per Person. 3) The human capital construct measured in terms of the Annual Cost of Training and Education per Person, adds to theories of IT adoption.
3.	The third stage of research identifies that the characteristics of ICTs, the access to ICTs, as well as personal inequalities could impact the direct effects of information provision and infrastructure development.

**Table 27. Summary of Implications**

Implications	Contribution and Conclusion
Implications for Research	This research helps achieve greater in-depth understanding of the relationships among these factors. Based on the analysis, the mixed method approach is appropriate for understanding how the ICT could impact the development of small businesses, including micro-enterprises in both China and the United States. In the future, more performance related data should be applied on top of data gathered from survey, interview, and case study.
Implications for Practice	Providing training opportunities for small business owners could be critical for the growth of small businesses. ICT can be a powerful tool only when it is utilized appropriately. While there are applications of advanced ICT like cloud computing and big data, the fit should be posited at the center. ICT must be aligned with the business activity and strategy so that it could further lead to the development. Practitioners will need to focus on the alternative goal of the business strategy, rather than chase the popular applications in IT.

## 9. REFERENCES

- Ajzen, I., and Fishbein, M. (1972). Attitudes and normative beliefs as factors influencing behavioral intentions. *Journal of Personality and Social Psychology*, 21 (1), 1-9.
- Alam, S. S., & Noor, M. K. M. (2009). ICT adoption in small and medium enterprises: An empirical evidence of service sectors in Malaysia. *International Journal of Business and Management*, 4(2), p112.
- Al-Natour, S., & Benbasat, I. (2009). The adoption and use of IT artifacts: A new interaction-centric model for the study of user-artifact relationships. *Journal of the Association for Information Systems*, 10(9), 2.
- Alonso-Mendo, F., Fitzgerald, G., & Frias-Martinez, E. (2009). Understanding web site redesigns in small-and medium-sized enterprises (SMEs): a UK-based study on the applicability of e-commerce Stage Models. *European Journal of Information Systems*, 18(3), 264-279.
- Antlová, K. (2009). Motivation and barriers of ICT adoption in small and medium-sized enterprises. *E & M Ekonomie a Management*, 12(2), 140-155.
- Aspaas, H. R. (2004). Minority women's microenterprises in rural areas of the United States of America: African American, Hispanic American and Native American case studies. *GeoJournal*, 61(3), 281-289
- Austin, A. (2013). "High Unemployment means Native Americans are still waiting for an Economic Recovery." Economic Policy Institute, Issue Brief #372. <http://s3.epi.org/files/2013/HIGH-UNEMPLOYMENT-MEANS-NATIVE-AMERICANS-ARE-STILL-WAITING-FOR-AN-ECONOMIC-RECOVERY.pdf>
- Avgerou, C. (2008). Information systems in developing countries: a critical research review. *Journal of information Technology*, 23(3), 133-146.
- Avgerou, C. (2010). Discourses on ICT and development. *Information Technologies & International Development*, 6(3), pp-1.
- Baliamoune-Lutz, M. (2003). An analysis of the determinants and effects of ICT diffusion in developing countries. *Information Technology for development*, 10(3), 151-169
- Bandura, A. (1986) *Social Foundations of Thought and Action: A Social Cognitive Theory*, Prentice Hall, Englewood Cliffs, NJ, 1986.
- Barba-Sánchez, V., Martínez-Ruiz, M. D. P., & Jiménez-Zarco, A. I. (2007). Drivers, benefits and challenges of ICT adoption by small and medium sized enterprises (SMEs): A literature review. *Problems and Perspectives in Management*, 5(1), 104-115.
- Barder, O. (2012) What Is Development? Retrieved via <http://www.cgdev.org/blog/what-development>
- Barrett, M., Heracleous, L., & Walsham, G. (2013). A rhetorical approach to IT diffusion: Reconceptualizing the ideology-framing relationship in computerization movements. *MIS Quarterly*, 37(1), 201-220.
- Bates, T. (1990). Entrepreneur human capital inputs and small business longevity. *The review of Economics and Statistics*, 551-559.

- Beaudry, A and Pinsonneault, A. (2010) Alain The other side of acceptance: studying the direct and indirect effects of emotions on information technology use. *MIS Quarterly* Volume 34 Issue 4, December 2010 Pages 689-710
- Becker, G. S., & Chiswick, B. R. (1966). Education and the Distribution of Earnings. *The American Economic Review*, 358-369.
- Becker and Woessmann (2011) The Effects of the Protestant Reformation on Human Capital in: Rachel McCleary (ed.) *The Oxford Handbook of the Economics of Religion*, 2011.
- Blanchflower, D. G., Levine, P. B., & Zimmerman, D. J. (2003). Discrimination in the small-business credit market. *Review of Economics and Statistics*, 85(4), 930-943.
- Blili, S., & Raymond, L. (1993). Information technology: Threats and opportunities for small and medium-sized enterprises. *International Journal of Information Management*, 13(6), 439-448.
- Bollou, F., & Ngwenyama, O. 2008. "Are ICT investments paying off in Africa? An analysis of total factor productivity in six West African countries from 1995 to 2002," *Information Technology for Development*, 14(4), 294-307.
- Braa, J. Monteiro, E. and S. Sahay. (2004) "Networks of Action: Sustainable Health Information Systems across Developing Countries." *MIS Quarterly*. 28, 3, 337-363.
- Brezis, E. S., Krugman, P. R., & Tsiddon, D. 1993. "Leapfrogging in international competition: A theory of cycles in national technological leadership," *The American Economic Review*, 1211-1219.
- Brown, A. E., & Grant, G. G. 2010. "Highlighting the duality of the ICT and development research agenda," *Information Technology for Development*, 16(2), 96-111.
- Byrne, E., & Sahay, S. 2007. "Participatory design for social development: A South African case study on community-based health information systems," *Information Technology for Development*, 13(1), 71-94.
- Çakar, N. D., & Ertürk, A. (2010). Comparing innovation capability of small and medium-sized enterprises: examining the effects of organizational culture and empowerment. *Journal of Small Business Management*, 48(3), 325-359.
- Carland, J. W., Hoy, F., Boulton, W. R., & Carland, J. A. C. (1984). Differentiating entrepreneurs from small business owners: A conceptualization. *Academy of management review*, 9(2), 354-359.
- Carless, S. A. (2005) Person–job fit versus person–organization fit as predictors of organizational attraction and job acceptance intentions: A longitudinal study *Journal of Occupational and Organizational Psychology* (2005), 78, 411–429
- Carmel, E., & Nicholson, B. (2005). Small firms and offshore software outsourcing: High transaction costs and their mitigation. *Journal of Global Information Management (JGIM)*, 13(3), 33-54.
- Castells, M. 2001. *The Internet galaxy: Reflections on the Internet, business, and society*. Oxford University Press, Inc..
- Cecchini, S. and C. Scott, (2003) "Can information and communications technology applications contribute to poverty reduction? Lessons from rural India." *Information Technology for Development*, 10, 2, 73-85

- Ceridian UK Ltd. (2007) Human Capital White Paper Retrieved on September 17, 2012 via [http://www.ceridian.co.uk/hr/downloads/HumanCapitalWhitePaper\\_2007\\_01\\_26.pdf](http://www.ceridian.co.uk/hr/downloads/HumanCapitalWhitePaper_2007_01_26.pdf)
- Chakraborty, J., & Bosman, M. M. (2005). Measuring the digital divide in the United States: Race, income, and personal computer ownership. *The Professional Geographer*, 57(3), 395-410.
- Chang, H., Chi, N., and Chuang, A. (2010) Exploring the Moderating Roles of Perceived Person–Job Fit and Person–Organisation Fit on the Relationship between Training Investment and Knowledge Workers’ Turnover Intentions. *APPLIED PSYCHOLOGY: AN INTERNATIONAL REVIEW*, 2010, 59 (4), 566–593 doi: 10.1111/j.1464-0597.2009.00412.x
- Chau, P.Y.K., and Tam, K.Y. Factors Affecting the Adoption of Open Systems: An Exploratory Study, *MIS Quarterly* (21:1), March 1997, pp. 1-24.
- Chay, Y.W. (1993) Social support, individual differences and well-being: A study of small business entrepreneurs and employees *Journal of Occupational & Organizational Psychology* Date: December 1, 1993
- Chen, J. C., Parker, L. J., & Lin, B. (2006). Technopreneurship in Native American businesses: current issues and future with a case study. *International Journal of Management and Enterprise Development*, 3(1), 70-84.
- CHI Research. (2003) Retrieved 2011-11-13 from <http://www.sba.gov/advo/research/rs225.pdf>
- China Statistical Yearbook (2010) National Bureau of Statistics of China
- Chudnovsky, D., & López, A. (2005). The software and information services sector in Argentina: the pros and cons of an inward-oriented development strategy. *Information Technology for Development*, 11(1), 59-75.
- Coleman, J. S. (1988). Social capital in the creation of human capital. *American journal of sociology*, S95-S120.
- Compeau, D. R., and Higgins, C.A. (1995) Application of Social Cognitive theory to training for computer skills, *Information System Research* (6:2), 1995, pp. 118-143
- Conger, J. A., & Kanungo, R. N. (1988). The empowerment process: Integrating theory and practice. *Academy of management review*, 13(3), 471-482.
- Cooper, A. C. (1981). Strategic management: New ventures and small business. *Long range planning*, 14(5), 39-45.
- Cornelissen, J. P., & Werner, M. D. (2014). Putting framing in perspective: A review of framing and frame analysis across the management and organizational literature. *The Academy of Management Annals*, 8(1), 181-235.
- Cragg, P., King, M., & Hussin, H. (2002). IT alignment and firm performance in small manufacturing firms. *The Journal of Strategic Information Systems*, 11(2), 109-132.
- Credé, A., & Mansell, R. E. 1998. Knowledge Societies--in a Nutshell: Information Technology for Sustainable Development. IDRC.
- Dai, H. and Palvia, P.C., (2008) Factors Affecting Mobile Commerce Adoption: A Cross-Cultural Study in China and The United States . *AMCIS 2008 Proceedings*. Paper 204.

- Davis, F.D. (1989) Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information. *MIS Quarterly*,(13:3), pp. 319-339
- Davis, F.D. , Bagozzi, R. P., and Warshaw, P. R. (1992) Extrinsic and Intrinsic Motivation to Use Computers in the Workplace. *Journal of Applied Social Psychology* (22:14), pp. 1111-1132.
- DeLone, W. H. (1988). Determinants of success for computer usage in small business. *MIS Quarterly*, 51-61.
- Desilver, D. (2013). "Black unemployment rate is consistently twice that of whites" Pew Research Center. August 21, 2013. <http://www.pewresearch.org/fact-tank/2013/08/21/through-good-times-and-bad-black-unemployment-is-consistently-double-that-of-whites/>
- Deutsch, M. and Gerard, H.B.(1995) A study of normative and informational socialinfluences upon individual judgment *Journal of Abnormal and Social Psychology*, 51 (1995), pp. 624–636
- Deweese, S., & Foxworth, R. (2013). From Dependency to Self-Determination: Native Americans and Economic Development in the 21 st Century. *The Economics of Inequality, Poverty, and Discrimination in the 21st Century* [2 Volumes], 194.
- Dibrell, C., Davis, P. S., & Craig, J. (2008). Fueling innovation through information technology in SMEs\*. *Journal of small business management*,46(2), 203-218.
- Donner, J. (2004). Microentrepreneurs and mobiles: An exploration of the uses of mobile phones by small business owners in Rwanda. *Information Technologies and International Development*, 2(1), 1-22.
- Druckman, J. N. (2001). The implications of framing effects for citizen competence. *Political Behavior*, 23(3), 225-256.
- Duncombe, R., & Heeks, R. (2002). Enterprise across the digital divide: information systems and rural microenterprise in Botswana. *Journal of International Development*, 14(1), 61-74.
- Economist (2013) Why does Kenya lead the world in mobile money? <http://www.economist.com/blogs/economist-explains/2013/05/economist-explains-18>
- Escobar, A. 1995. *Encountering Development: The Making and Unmaking of the Third World*. Princeton: Princeton University Press
- Ewusi-Mensah, K. 2012. "Problems of information technology diffusion in sub-Saharan Africa: the case of Ghana," *Information Technology for Development*,18(3), 247-269.
- Fairlie, R. W. (1999). The absence of the African-American owned business: An analysis of the dynamics of self-employment. *Journal of Labor Economics*, 17(1), 80-108.
- Flyvbjerg, B. (2011) "Case study" *The Sage Handbook of Qualitative Research*, 4<sup>th</sup> Edition Thousand Oaks, CA: Sage, 2011, Chapter 17, pp.301-316
- Gabrielsson, J. (2007). Correlates of board empowerment in small companies. *Entrepreneurship Theory and Practice*, 31(5), 687-711.
- Garsombke, D. J., & Garsombke, T. W. (2000). Non-traditional vs. traditional entrepreneurs: Emergence of a Native American comparative profile of characteristics and barriers. *Academy of Entrepreneurship Journal*, 6(1), 93-100.
- Gefen, D., Karahanna, E., & Straub, D. W. (2003). Trust and TAM in online shopping: an integrated model. *MIS quarterly*, 27(1), 51-90.



- Ghobakhloo, M., Arias-Aranda, D., & Benitez-Amado, J. (2011). Adoption of e-commerce applications in SMEs. *Industrial Management and Data Systems*, 111(8), 1238-1269
- Giddens, A. 2000. *Runaway World: How Globalization is Reshaping Our Lives*. New York.
- Ginzberg, M.J. (1981) Key Recurrent Issues in the MIS Implementation Process, *MIS Quarterly*, 5 (1981): 47-59
- Granovetter, M. (1985). Economic action and social structure: the problem of embeddedness. *American journal of sociology*, 481-510.
- Greig, A., Hulme, D., Turner, M. (2007). *Challenging global inequality: Development theory and practice in the 21st century*. Palgrave Macmillan, New York, NY, USA.
- Grosh, B., & Somolekae, G. (1996). Mighty oaks from little acorns: Can microenterprise serve as the seedbed of industrialization?. *World Development*, 24(12), 1879-1890.
- Gutierrez, L. M. (1990). Working with women of color: An empowerment perspective. *Social work*, 35(2), 149-153.
- Ha, S. and Stoel, L (2009) Consumer e-shopping acceptance: Antecedents in a technology acceptance model. *Journal of Business Research* Volume 62, Issue 5, May 2009, Pages 565–571
- Habermas, J and Ben-Habib, S (1981) Modernity versus Postmodernity *New German Critique*, No. 22, *Special Issue on Modernism* (Winter, 1981), pp. 3-14
- Hair, J. F. J. , Black, W.C., Babin, B.J., and Anderson, R. E. (2010) *Multivariate Data Analysis Seventh Edition* Prentice Hall
- Han, R. (2000) “Software engineering services for export and small developing economies.” *Information Technology for Development*, 9, 2, 77-91.
- Hargittai, E. (2002). Second-level digital divide: Differences in people's online skills. *First monday*, 7(4).
- Harrison, D. A., Mykytyn Jr, P. P., & Riemenschneider, C. K. (1997). Executive decisions about adoption of information technology in small business: Theory and empirical tests. *Information Systems Research*, 8(2), 171-195.
- Hatcher, L. & Stepanski, E. (1994). *A step-by-step approach to using the SAS system for univariate and multivariate statistics*. Cary, NC: SAS Institute Inc.
- Hawk, S. and W. McHenry (2005) “The Maturation of the Russian Offshore Software Industry” *Information Technology for Development*, 11, 1.
- Heeks, R. 2002. “Information systems and developing countries: Failure, success, and local improvisations,” *The information society*, 18(2), 101-112.
- Heeks, R. (2008). “ICT4D2.0: The Next Phase of Applying ICT for International Development”, *Computer*, vol. 41, no. 6, pp. 26-33, Mar, 2014
- Held, D. and McGrew, A., Goldblatt, D. and Perraton, J. 1999, *Global Transformations: Politics, Economics and Culture*, Polity Press, Cambridge.
- Hirschheim, R., & Klein, H. K. (2012). A glorious and not-so-short history of the information systems field. *Journal of the Association for Information Systems*, 13(4), 188.
- Hirst, P., & Thompson, G. 1996. *Globalization in Question: The International Economy and the Possibilities of Governance*. Cambridge: Polity.

- Hsu, C. and Lin, J.C. (2008) Acceptance of blog usage: The roles of technology acceptance, social influence and knowledge sharing motivation *Information & Management* Volume 45, Issue 1, January 2008, Pages 65–74  
<http://dx.doi.org/10.1016/j.im.2007.11.001>
- Hughes, K. D. (2003). Pushed or Pulled? Women's Entry into Self-Employment and Small Business Ownership. *Gender, Work & Organization*, 10(4), 433-454.
- Iacovou, C. L., Benbasat, I., & Dexter, A. S. (1995). Electronic data interchange and small organizations: adoption and impact of technology. *MIS quarterly*, 465-485.
- Im, I., Hong, S., & Kang, M. S. (2011). An international comparison of technology adoption: Testing the UTAUT model. *Information & Management*, 48(1), 1-8.
- ITU 2014. "Manual for Measuring ICT Access and Use by Households and Individuals 2014" Retrieved Sep 25, 2014, from [http://www.itu.int/dms\\_pub/itu-d/opb/ind/D-IND-ITCMEAS-2014-PDF-E.pdf](http://www.itu.int/dms_pub/itu-d/opb/ind/D-IND-ITCMEAS-2014-PDF-E.pdf)
- Jahrig, Shannon H (1996) Crossing the cultural divide: Organizational support for Indians in business *Montana Business Quarterly*; Summer 1996; 34, 2; *ABI/INFORM Global* pg. 2
- Jimenez, N., Najjar, L., Qureshi, S., & Haworth, D. 2013. "Information and Communication Technologies Effects on Economic Growth," AMCIS 2013
- Kamal, M. and S. Qureshi, (2009). "Sustaining the Growth of Micro-enterprises that Adopt Information and Communication Technologies" Proceedings of the Second Annual Workshop on Global Development. Phoenix December.  
<http://www.globdev.org/?q=node/71>
- Kamal, M., Song, C., Qureshi, S. and K. Kriz. (2010) "Information and Communication Technology Interventions to Bridge the Digital Divide," *43rd Annual Hawaii International Conference on System Sciences (HICSS'10)*, 2010.
- Kamal, M., Qureshi, S., Najjar, L. 2008. "A Global Analysis of the Effect of IT Capacity on Development – Understanding Sourcing of Skills". CONF-IRM 2008 Proceedings. Paper 4. <http://aisel.aisnet.org/confirm2008/4>
- Karagozoglu, N., & Lindell, M. (1998). Internationalization of small and medium-sized technology-based firms: An exploratory study. *Journal of Small Business Management*, 36(1), 44.
- Karahanna, E., Staub, D.W., Chevany, N.L. (1999) Information Technology Adoption Across Time: A Cross-Sectional Comparison of Pre-Adoption and Post-Adoption Beliefs *MIS Quarterly* Vol. 23, No. 2 (Jun., 1999), pp. 183-213
- Kaplan, S., & Tripsas, M. (2008). Thinking about technology: Applying a cognitive lens to technical change. *Research Policy*, 37(5), 790-805.
- Kenny, C.J. (2000) "Expanding Internet access to the rural poor in Africa". *Information Technology for Development*, 9,1, 25-32.
- Kimaro, H. C., & Nhampossa, J. L. (2005). Analyzing the problem of unsustainable health information systems in less-developed economies: case studies from Tanzania and Mozambique. *Information Technology for Development*, 11(3), 273-298.
- King, W. R., & He, J. (2006). A meta-analysis of the technology acceptance model. *Information & management*, 43(6), 740-755.

- Kleine, D. (2015). The value of social theories for global computing. *Communications of the ACM*, 58(9), 31-33.
- Kobe, K. (2007). The Small Business Share of GDP, 1998-2004. Advocacy-funded research. Retrieved 2011-11-13 from <http://web.sba.gov/faqs/faqindex.cfm?areaID=24>
- Kraemer, K. L., & Dedrick, J. 1994. "Payoffs from investment in information technology: Lessons from the Asia-Pacific region," *World Development*, 22(12), 1921-1931.
- Kristof, A. L. (1996). Person-organization fit: an integrative review of its conceptualizations, measurement, and implications. *Personnel Psychology*, 49, 1-49.
- Krogstad, J.M. (2014). "1-in-4 Native Americans and Alaska Natives are living in poverty". Pew Research Center. June 13, 2014. <http://www.pewresearch.org/fact-tank/2014/06/13/1-in-4-native-americans-and-alaska-natives-are-living-in-poverty/>
- La Rovere, R. L., & Pereira, M. V. R. (2000, May). Adoption of ICT and competitiveness in the tourism sector: the case of Brazilian travel agencies. In Proceedings of the 6th International Working Conference of IFIP WG 9.4: Information Flows, Local Improvisations and Work Practices. SBS Conferences, Cape Town.
- Lee, A. S. (2010). Retrospect and prospect: Information systems research in the last and next 25 years. *Journal of Information Technology*, 25(4), 336-348.
- Lee, A. S., & Baskerville, R. L. 2003. "Generalizing generalizability in information systems research," *Information systems research*, 14(3), 221-243.
- Lee, K., & Lim, C. 2001. "Technological regimes, catching-up and leapfrogging: findings from the Korean industries," *Research policy*, 30(3), 459-483.
- Leonardi, P. M. (2011). Innovation blindness: Culture, frames, and cross-boundary problem construction in the development of new technology concepts. *Organization Science*, 22(2), 347-369.
- Li, L. (2010). A critical review of technology acceptance literature. Retrieved April, 19, 2011.
- Macartney, S., Bishaw, A., and K. Fontenot. (2013). "Poverty Rates for Selected Detailed Race and Hispanic Groups by State and Place: 2007-2011." *American Community Survey Briefs*. February 2013. <http://www.census.gov/prod/2013pubs/acsbr11-17.pdf>
- MacGregor, R. C., & Vrazalic, L. (2005). A basic model of electronic commerce adoption barriers: A study of regional small businesses in Sweden and Australia. *Journal of small business and enterprise development*, 12(4), 510-527.
- Madrid-Guijarro, A., Garcia, D., & Van Auken, H. (2009). Barriers to innovation among Spanish manufacturing SMEs. *Journal of Small Business Management*, 47(4), 465-488.
- Malecki, E. J. (1997) *Technology and Economic Development: The Dynamics of Local, Regional and National Competitiveness* 2nd edition. London and Boston: Addison Wesley Longman, 1997.
- Mankiw, N. G. 2012. *Macroeconomics* Worth Publishers; Eighth Edition edition
- Mankiw, N. G., Romer, D., & Weil, D. N. 1992. "A contribution to the empirics of economic growth (No. w3541)". National Bureau of Economic Research.

- Manochehri, N., Al-Esmail, R., & Ashrafi, R. (2012). Examining the impact of information and communication technologies (ICT) on enterprise practices: A preliminary perspective from Qatar. *The Electronic Journal of Information Systems in Developing Countries*, 51.
- Mansell, R., & Wehn, U. (Eds.). 1998. Knowledge societies: information technology for sustainable development. United Nations Publications.
- Martin, L. M., & Matlay, H. (2001). "Blanket" approaches to promoting ICT in small firms: some lessons from the DTI ladder adoption model in the UK. *Internet research*, 11(5), 399-410.
- Matlay, H., & Addis, M. (2003). Adoption of ICT and e-commerce in small businesses: an HEI-based consultancy perspective. *Journal of Small Business and Enterprise Development*, 10(3), 321-335.
- McConnaughey, J., Everette, D., Reynolds, T., & Lader, W. (1999). Falling through the net: Defining the digital divide. Report by the US Department of Commerce, National Telecommunications and Information Administration (NTIA). [Available online: [http://www.ntia.doc.gov/ntia\\_home/fttn99/contents.html](http://www.ntia.doc.gov/ntia_home/fttn99/contents.html)].
- McGee, J. E., & Sawyerr, O. O. (2003). Uncertainty and information search activities: a study of owner-managers of small high-technology manufacturing firms. *Journal of Small Business Management*, 41(4), 385-401.
- Midgley, J. with Hall, A., Hardiman, M. and Narine, D. (1986) *Community Participation, Social Development and the State*, London: Methuen.
- Mincer, J. (1958). Investment in human capital and personal income distribution. *The Journal of Political Economy*, 66, 281-302.
- Moen, Ø., & Servais, P. (2002). Born global or gradual global? Examining the export behavior of small and medium-sized enterprises. *Journal of international marketing*, 10(3), 49-72.
- Molla, A., Heeks, R., & Balcells, I. (2006). Adding clicks to bricks: a case study of e-commerce adoption by a Catalan small retailer. *European Journal of Information Systems*, 15(4), 424-438.
- Montazemi, A. R. (1988). Factors affecting information satisfaction in the context of the small business environment. *MIS quarterly*, 239-256.
- Morales, L. F., & Qureshi, S. (2010). Investigating the Effects of IT Adoption between Micro-Enterprises from an Ethnic Community in the United States. University of Nebraska, Third Annual Workshop, Saint Louis, USA, December.
- Morales-Gomez, D., & Melesse, M. 1998. "Utilising information and communication technologies for development: the social dimensions," *Information technology for Development*, 8(1), 3-13.
- Mossberger, K., Tolbert, C. J., & Gilbert, M. (2006). Race, place, and information technology. *Urban Affairs Review*, 41(5), 583-620.
- Mosse, E. L., & Sahay, S. (2005). The role of communication practices in the strengthening of counter networks: Case experiences from the health care sector of Mozambique. *Information Technology for Development*, 11(3), 207-225.
- Moyi, E. D. (2003). Networks, information and small enterprises: New technologies and the ambiguity of empowerment. *Information Technology for Development*, 10(4), 221-232.

- National Rural Funders Collaborative, 2014  
<http://www.nrfc.org/In/documents/Ent%20Dev%20in%20Native%20American%20Communities.pdf>
- Nebraska Sioux Lean Beef, Part A (2008). A Teaching Case Study in Tribal Management for Oglala Lakota Collge.  
[http://hpaied.org/images/resources/publibrary/NSLB\\_Part\\_A.pdf](http://hpaied.org/images/resources/publibrary/NSLB_Part_A.pdf)
- Ngwenyama, O., & Morawczynski, O. (2009). Factors affecting ICT expansion in emerging economies: An analysis of ICT infrastructure expansion in five Latin American countries. *Information technology for development*, 15(4), 237-258
- Norris, P. (2001). *Digital divide: Civic engagement, information poverty, and the Internet worldwide*. Cambridge University Press.
- NTIA (2010) *Exploring the Digital Nation: Home Broadband Internet Adoption in the United States*  
[http://www.ntia.doc.gov/files/ntia/publications/esa\\_ntia\\_us\\_broadband\\_adoption\\_report\\_11082010\\_1.pdf](http://www.ntia.doc.gov/files/ntia/publications/esa_ntia_us_broadband_adoption_report_11082010_1.pdf)
- Nui Polatoglu, V. (2007). Strategies that work-the case of an e-retailer in an emerging market. *International Journal of Emerging Markets*, 2(4), 395-405.
- OECD (2015) <https://stats.oecd.org/glossary/detail.asp?ID=3123>
- OH, K-Y., CRUICKSHANK, D. and ANDERSON, A. R., 2009. The adoption of e-trade innovations by Korean small and medium sized firms. *Technovation*, 29 (2), pp. 110-121
- Oliver, P. E., & Johnston, H. (2000). What a good idea! Ideologies and frames in social movement research. *Mobilization: An International Quarterly*, 5(1), 37-54.
- Omaha chamber of commerce (2012)  
[http://www.selectgreateromaha.com/Site\\_Selection\\_Data.aspx](http://www.selectgreateromaha.com/Site_Selection_Data.aspx)
- O'Reilly, C.A., Jennifer Chatman and David F. Caldwell *People and Organizational Culture: A Profile Comparison Approach to Assessing Person-Organization Fit* *The Academy of Management Journal* Vol. 34, No. 3 (Sep., 1991), pp. 487-516
- Orlikowski, W. J., & Barley, S. R. (2001). Technology and institutions: What can research on information technology and research on organizations learn from each other?. *MIS quarterly*, 25(2), 145-165.
- Orlikowski, W. J., & Iacono, C. S. 2001. "Research commentary: Desperately seeking the "IT" in IT research—A call to theorizing the IT artifact," *Information systems research*, 12(2), 121-134.
- Paniccia, I. (1998). One, a hundred, thousands of industrial districts. *Organizational variety in local networks of small and medium-sized enterprises. Organization Studies*, 19(4), 667-699.
- Petersen, M. A., & Rajan, R. G. (1994). The benefits of lending relationships: Evidence from small business data. *The journal of finance*, 49(1), 3-37.
- Pick, J. B., & Azari, R. 2008. "Global digital divide: Influence of socioeconomic, governmental, and accessibility factors on information technology," *Information Technology for Development*, 14(2), 91-115.
- Pickard, A. (2012). *Research methods in information*. Facet publishing.

- Porter, M. E. (1985). Technology and competitive advantage. *Journal of business strategy*, 5(3), 60-78.
- Preis-Heje, J., Baskerville, R. and G.Hansen (2005) "Strategy Models for Enabling Offshore Outsourcing: Russian Short-Cycle-Time Software Development". *Information Technology for Development*, 11, 1
- Premkumar, G., & Roberts, M. (1999). Adoption of new information technologies in rural small businesses. *Omega*, 27(4), 467-484.
- Qiang, C., Pitt, A., & S. Ayers. 2003. "Contribution of Information and Communication Technologies to Growth," *World Bank Working Paper No. 24*. World Bank. <http://Inweb18.worldbank.org/ict/projects.nsf/WSISPublication>
- Quaddus, M., & Hofmeyer, G. (2007). An investigation into the factors influencing the adoption of B2B trading exchanges in small businesses. *European Journal of Information Systems*, 16(3), 202-215.
- Qureshi, S. (1998) "Fostering Associations in Africa through Networking." *Information Technology for Development*, 8, 1, 121-136.
- Qureshi, S. (2011). Globalization in development: do information and communication technologies really matter?. *Information Technology for Development*, 17(4), 249-252.
- Qureshi, S., & Lamsam, T. (2008). Transcending the digital divide: A framing analysis of information and communication technologies news in Native American tribal newspapers. In *Hawaii International Conference on System Sciences, Proceedings of the 41st Annual* (pp. 124-124). IEEE.
- Qureshi, S., (2005) How does Information technology effect Development? Integrating Theory and Practice into a process model. *Processdings of the eleventh Americas Conference on Information Systems*, Omaha, NE
- Qureshil, S., Kamal, M., & Wolcott, P. (2009). Information technology interventions for growth and competitiveness in micro-enterprises. *International Journal of E-Business Research*, 5(1), 117-140.
- Qureshi, S., Keen, P. and M. Kamal, (2009). "Business Models for Development: The Global Capability Sourcing Model." In S. Kamel eds "*E-Strategies for Technological Diffusion and Adoption: National ICT Approaches for Socioeconomic Development*", IGI.
- Qureshi, S., and York, A. S. (2008). Information Technology Adoption by Small Businesses in Minority and Ethnic Communities. *Hawaii International Conference on System Sciences, Proceedings of the 41st Annual*, 447.
- Qureshi, S. (2015). Are we making a better world with information and communication technology for development (ICT4D) research? Findings from the field and theory building. *Information Technology for Development*, 21(4), 511-522.
- Raymond, L. (1985). Organizational characteristics and MIS success in the context of small business. *Mis Quarterly*, 37-52.
- Richardson, J. & McLeod, S. (2011). Technology leadership in Native American schools. *Journal of Research in Rural Education*, 26(7). Retrieved from <http://sites.psu.edu/jrre/wp-content/uploads/sites/6347/2014/02/26-7.pdf>
- Riemenschneider, C. K., Harrison, D. A., & Mykytyn, P. P. (2003). Understanding IT adoption decisions in small business: integrating current theories. *Information & Management*, 40(4), 269-285.

- Robertson, R. 1992. *Globalization: Social Theory and Global Culture*. London: Sage.
- Rodrigo, M. M. T. (2003) "Tradition or transformation? An evaluation of ICTs in Metro Manila schools." *Information Technology for Development*, 10, 2, 95-123.
- Rodrigues, A.J. and S. Govinda (2003) "Towards an integrated management information system: A case of the University of Mauritius." *Information Technology for Development*, 10, 1, 41-57.
- Roztocki, N., & Weistroffer, H. (2009). Research trends in information and communications technology in developing, emerging and transition economies. *Collegium of Economic Analysis*, 20, 113-127.
- Sachs, W. 1999. *Planet dialectics: Explorations in environment & development*. Zed Books, London, UK.
- Sadowski, B. M., Maitland, C., & van Dongen, J. (2002). Strategic use of the Internet by small-and medium-sized companies: an exploratory study. *Information Economics and Policy*, 14(1), 75-93.
- Sahay, S., B. Nicholson, and S. Krishna (2003) *Global IT Outsourcing: Software Development Across Borders*, Cambridge University Press, Cambridge, UK.
- Samoilenko, S., & Osei-Bryson, K. M. 2011. "The spillover effects of investments in telecoms: insights from transition economies," *Information Technology for Development*, 17(3), 213-231.
- SBA's Definitions of Small Business  
[http://archive.sba.gov/idc/groups/public/documents/sba\\_homepage/guide\\_to\\_size\\_standards.pdf](http://archive.sba.gov/idc/groups/public/documents/sba_homepage/guide_to_size_standards.pdf)
- Scheepers, H. and C. de Villiers (2000) "Teaching of a computer literacy course in South Africa: A case study using traditional and co-operative learning." *Information Technology for Development*, 9, 3/4, 175-188.
- Scheufele, D. A. (1999). Framing as a theory of media effects. *Journal of communication*, 49(1), 103-122.
- Scholte, J.A. 1993. *International Relations of Social Change*. Buckingham: Open University Press.
- Schreiner, M. and Woller, G. (2003), "Micro-enterprise development programs in the United States and in the developing world", *World Development*, Vol. 31 No. 9, pp. 1567-80.
- Schreyer, P. (2000) *The Contribution of Information and Communication Technology to Output Growth A Study of the G7 Countries*. Retrieved on 2012.12.06
- Schultz, T. W. (1961). Investment in human capital [Presidential address delivered at the annual meeting of the American Economic Association, Saint Louis, MO, December, 1960]. *The American Economic Review*, 51, 1-17.
- Schumacher, E. F. (1989) *Small Is Beautiful: Economics as if People Mattered* NY: HarperPerennial 2<sup>nd</sup> edition
- Schumpeter, J. (1934). *Capitalism, socialism, and democracy*. New York: Harper & Row.
- Schumpeter, J.A. 1934. *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle* NJ:Transaction Publishers
- Schwarzer, R., Bäßler, J. , Kwiatek, P. Schröder, K. , and Zhang, J.X. (1997) The Assessment of Optimistic Self-beliefs: Comparison of the German, Spanish, and Chinese Versions of the General Self-efficacy Scale *Applied Psychology* Volume 46, Issue 1, pages 69–88, January 1997DOI: 10.1111/j.1464-0597.1997.tb01096.x

- Sein, M. K., & Harindranath, G. 2004. "Conceptualizing the ICT artifact: Toward understanding the role of ICT in national development," *The Information Society*, 20(1), 15-24.
- Sen, A. (1999). *Development as freedom*. Oxford University Press.
- Sen, A. (1973). *On economic inequality*. Oxford University Press.
- Servon, L. J. (2006). Microenterprise development in the United States: Current challenges and new directions. *Economic Development Quarterly*, 20(4), 351-367.
- Shiels, H., McIvor, R., & O'Reilly, D. (2003). Understanding the implications of ICT adoption: insights from SMEs. *Logistics Information Management*, 16(5), 312-326.
- Smith, L.I., (2002) A tutorial on Principal Components Analysis [http://www.cs.otago.ac.nz/cosc453/student\\_tutorials/principal\\_components.pdf](http://www.cs.otago.ac.nz/cosc453/student_tutorials/principal_components.pdf)
- Small Business Administration (2015) Retrieved on 2015.01. 18 via [https://www.sba.gov/sites/default/files/files/Nebraska13\(1\).pdf](https://www.sba.gov/sites/default/files/files/Nebraska13(1).pdf)
- Summary of Size Standards by Industry (2011) Retrieved on 2011.11.06 via <http://www.sba.gov/content/summary-size-standards-industry>
- Song, Y. (2007) "Internet news media and issue development: a case study on the roles of independent online news services as agenda-builders for anti-US protests in South Korea." *New Media Society*, (9), pp.71-92, 2007.
- Song, C., and S. Qureshi, (2010) "The Role of an Effective IT Intervention for Micro-enterprises" in the *16th Americas Conference on Information Systems Proceedings*. Lima, Peru, August 2010.
- Steinmueller, W. E. 2001. "ICTs and the possibilities for leapfrogging by developing countries," *International Labour Review*, 140(2), 193-210
- Strahan, P. E., & Weston, J. P. (1998). Small business lending and the changing structure of the banking industry. *Journal of Banking & Finance*, 22(6), 821-845.
- Street, C. T., & Meister, D. B. (2004). Small business growth and internal transparency: the role of information systems. *MIS quarterly*, 473-506.
- Summary of Size Standards by Industry (2011) Retrieved on 2011.11.06 via <http://www.sba.gov/content/summary-size-standards-industry>
- Summer, A. & Tribe, M.A (2008) *International development studies : theories and methods in research and practice* London ; Thousand Oaks, Calif. : Sage, 2008.
- Swinney, J., & Runyan, R. (2007). Native American entrepreneurs and strategic choice. *Journal of Developmental Entrepreneurship*, 12(03), 257-273.
- Tan, F. B., & Leewongcharoen, K. (2005). Factors contributing to IT industry success in developing countries: The case of Thailand. *Information Technology for Development*, 11(2), 161-194.
- The Standard Definition of Small and medium enterprises of China (2011) Retrieved on 2011.11.06 via [http://www.gov.cn/zwggk/2011-07/04/content\\_1898747.htm](http://www.gov.cn/zwggk/2011-07/04/content_1898747.htm) (In Chinese)
- Thompson, M. (2004). Discourse, 'development' & the 'digital divide': ICT & the World Bank. *Review of African Political Economy*, 31(99), 103-123.
- Thompson, R.L., Higgins, C.A., and Howell, J.M. (1991) *Personal Computing: Toward a Conceptual Model of Utilization*, *MIS Quarterly* (15:1), 1991, pp. 124-143
- Thong, J. Y. L. (1999). An integrated model of information systems adoption in small businesses. *Journal of Management Information Systems*, 15(4), 187-214.



- Tipton, R. H. (2004). Microenterprise through Microfinance and Microlending: The Missing Piece in the Overall Tribal Economic Development Puzzle. *American Indian Law Review*, 29(1), 173-192.
- Tornatzky, L.G. and Fleischer, M. (1990) The processes of Technological Innovation, Lexington, MA:Lexington Books
- Tractinsky, N., & Jarvenpaa, S. L. (1995). Information systems design decisions in a global versus domestic context. *Mis Quarterly*, 507-534.
- Tripsas (1997) Unraveling the Process of Creative Destruction: Complementary Assets and Incumbent Survival in the Typesetter Industry. *Strategic Management Journal*, Vol. 18 (Summer Special Issue), 119–142 (1997)
- United Nations, (2010) The Millennium Development Goals Report;New York.Retrieved on 2012.12.06  
via<http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%20-low%20res%2020100615%20-.pdf>
- United States Census Bureau (2011) <http://www.census.gov/main/www/access.html>
- United States Census Bureau, Population Division (2011) Annual Estimates of the Resident Population for the United States, Regions, States, and Puerto Rico: April 1, 2010 to July 1, 2011
- UNCTAD (2011) [http://unctad.org/en/docs/tdr2011\\_en.pdf](http://unctad.org/en/docs/tdr2011_en.pdf)
- United Nations, (2010) The Millennium Development Goals Report;New York.Retrieved on 2011.11.06 via  
<http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%20-low%20res%2020100615%20-.pdf>
- United Nations. 2006 . "United Nations E-Government Survey 2014" Retrieved Sep 25, 2014, from [http://unpan3.un.org/egovkb/Portals/egovkb/Documents/un/2014-Survey/E-Gov\\_Complete\\_Survey-2014.pdf](http://unpan3.un.org/egovkb/Portals/egovkb/Documents/un/2014-Survey/E-Gov_Complete_Survey-2014.pdf)
- Unwin, P. T. H. (Ed.). 2009. ICT4D: Information and communication technology for development. Cambridge University Press.Norris
- USSBA-United States Small Business Administration Advocacy Small Business Statistics and Research. Retrieved 2011-11-14 from <http://web.sba.gov/faqs/faqindex.cfm?areaID=24>
- Van Dijk, J. A. G. M. (2012). The evolution of the digital divide: The digital divide turns to inequality of skills and usage. J. Bus, M. Crompton, M. Hildebrandt, & G. Metakides (Eds.), *Digital enlightenment yearbook*, 2012, 57-75.
- Varma, R. (2005) Out of the Mix: Native Americans in Information Technology *Proceedings of the 2005 American Society for Engineering Education Annual Conference & Exposition*
- Venkatesh, V., Morris, M. G., Davis, G.B. and Davis, F.D. (2003) User Acceptance of Information Technology: Toward a Unified View *MIS Quarterly*, Vol. 27, No. 3 (Sep., 2003), pp. 425-478
- Venkatesh, V., Brown, S. A., & Bala, H. (2013). Bridging the Qualitative-Quantitative Divide: Guidelines for Conducting Mixed Methods Research in Information Systems. *MIS quarterly*, 37(1), 21-54.
- Wallerstein, I. 1974. *The Modern World System*, Vol. I. New York: Academic Press
- Walsham, G. (2012). Are we making a better world with ICTs? Reflections on a future agenda for the IS field. *Journal of Information Technology*, 27(2), 87-93.

- Walsham, G., & Sahay, S. (2006). Research on information systems in developing countries: Current landscape and future prospects. *Information technology for development*, 12(1), 7-24.
- Walsham, G. and S. Sahay (1999) "GIS for district-level administration in India: Problems and opportunities" *MIS Quarterly*, 23, 1, 39-65.
- Walsham, G., and Sahay, S. (2010) Research on information systems in developing countries: Current landscape and future prospects. *Information Technology for Development*, 12:1, 7-24
- Watson, H. J., & Gray, P. (1997). *Decision support in the data warehouse*. Prentice Hall Professional Technical Reference.
- Warschauer, M. (2004) *Technology and Social Inclusion: Rethinking the Digital Divide* 272 pages. The MIT Press, Cambridge.
- Webster, J., & Watson, R. T. (2002). Analyzing the past to prepare for the future: Writing a literature review. *Management Information Systems Quarterly*, 26(2), 3.
- Willcocks, L.P., Hindle, J., Feeny, D.F., and Lacity, M.C. "IT and business process outsourcing: The knowledge potential," *Information Systems Management* (21:3), 2004, pp. 7-15.
- Williams, M. D., Rana, N. P., Dwivedi, Y. K., & Lal, B. (2011, June). Is UTAUT really used or just cited for the sake of it? a systematic review of citations of UTAUT's originating article. In ECIS.
- Willis, K. (2005) *Theories and Practices of Development*. London: Routledge.
- Willis, K. (2011) *Theories and Practices of Development* 2nd ed. T & F Books UK: Brighton, UK
- Wolcott, P., Kamal, M., and Qureshi, S. (2008) Meeting the challenges of ICT adoption by micro-enterprises. *Journal of Enterprise Information Management*. Vol. 21 No. 6 pp. 616-632 DOI 10.1108/17410390810911212
- World Bank Group. (2003) *ICT & Development. Enabling the Information Society*.
- World Bank (2015) Retrieved via [http://www.worldbank.org/depweb/english/beyond/beyondco/beg\\_01.pdf](http://www.worldbank.org/depweb/english/beyond/beyondco/beg_01.pdf)
- Wyer, P., & Mason, J. (1999). Empowerment in small businesses. *Participation and Empowerment: An International Journal*, 7(7), 180-193.
- Xiong, J., & Qureshi, S. (2012) Analysis of Information and Communications Technology Adoption between Small Businesses in China and the United States *18th Americas Conference on Information Systems (AMCIS 2012)* Seattle, USA, August 9, 2012
- Xiong, J., Qureshi, S. & Najjar, L (2013) Factors that affect Information and Communication Technology Adoption by Small Businesses in China *19th Americas Conference on Information Systems (AMCIS 2013)* Chicago, IL. Aug, 2013
- Xiong, J., Qureshi, S., & Lamsam, T. (2014). Effects of the Digital Divide: Evidence from African-American and Native-American Owned Micro-Enterprises. *20th Americas Conference on Information Systems (AMCIS 2014)*
- Xiong, J. & Qureshi, S. (2015) *Information Technology for Development in Small and Medium-Sized Enterprises* 2015 Pre-ICIS Workshop of the AIS SIG on ICT & Global Development (GlobDev)

- Xu, S., Zhu, K., Gibbs, J.,(2004) Global Technology, Local Adoption: A Cross-Country Investigation of Internet Adoption by Companies in the United States and China Electronic Markets Volume 14, Number 1, 2004
- Yap, C. S., Soh, C. P. P., & Raman, K. S. (1992). Information systems success factors in small business. *Omega*, 20(5), 597-609.
- Yu, J., Wang, Y., Wang Y., Song, L., (2011) The research on the China's small business development strategy. *Management World*. 2011 V.2
- Zhang, P., Scialdone, M., & Ku, M. C. (2011). IT artifacts and the state of IS research. ICIS 2011 Proceedings. Paper 14. <http://aisel.aisnet.org/icis2011/proceedings/generaltopics/14>
- Zhou, T., Lu, Y., & Wang, B. (2010). Integrating TTF and UTAUT to explain mobile banking user adoption. *Computers in human behavior*, 26(4), 760-767.

## APPENDIX A

### Enterprise Employment Size in the United States and Nebraska

	ENTERPRISE EMPLOYMENT SIZE in the United States				
	0-4	5-9	10-19	20-99	>100
NUMBER OF FIRMS	3,532,058	978,993	592,963	481,496	5,585,510
NUMBER OF ESTABLISHMENTS	3,540,155	993,101	626,981	651,624	1,542,182
EMPLOYMENT	5,857,662	6,431,931	7,961,281	18,880,001	74,295,090
ANNUAL PAYROLL (\$1,000)	230,422,086	218,085,669	284,251,614	746,085,051	3,686,053,485

Source: United States Census Bureau, Statistics of U.S. Businesses via <http://www.census.gov/econ/susb/>

	ENTERPRISE EMPLOYMENT SIZE in Nebraska				
	0-4	5-9	10-19	20-99	>100
NUMBER OF FIRMS	24,320	6,890	4,254	3,716	2,389
NUMBER OF ESTABLISHMENTS	24,366	6,991	4,505	5,122	10,569
EMPLOYMENT	40,723	45,032	56,398	137,072	518,456
ANNUAL PAYROLL (\$1,000)	1,230,209	1,301,134	1,666,605	4,634,044	21,137,161

Source: United States Census Bureau, Statistics of U.S. Businesses via <http://www.census.gov/econ/susb/>

## APPENDIX B

### The classification of the small businesses in China and the United States

	Size of the Employees		Size of the Business	
	USA (Fewer than the numbers indicated below )	China (Ranging from the two numbers indicated below)	USA (The maximal size of the company) in million USD	China (operating revenue ranging from the two numbers indicated below) in million CNY
Agriculture			0.4-7.0	0.50 -5
Manufacturing	500-1000	20-300		3 -20
Construction			7-33.5	3-50
Wholesale Trade	1000	5-20		10-50
Retail Trade		10-50	7-35.5	10-50
Transportation	500-1500	20-300	7-28	2-30
Warehousing		20-100	25.5	1-10
Postal Industry		20-300	7	1-20
Accommodation		10-100	7-30	1-20
Restaurants		10-100	7-35.5	1-20
Telecommunications	1500	10-100	15-25	1-10
Software and IT		10-100	25	0.5-10
Real estate			2-25.5	1-20
Property Management		100-300		5-10
Rental and Leasing Service		10-100	7-25.5	1-80
Others		10-100		

## APPENDIX C

### Instrument

Variable	Definition	Items
Perceived Usefulness (PU)(Davis 1989 and Davis et al 1989)	The degree to which a person believes that using a particular system would enhance his or her job performance	PU-1. Using ICT in my job would enable me to accomplish tasks more quickly. PU-2.Using ICT would improve my job performance. PU-3. Using ICT would enhance my effectiveness on the job. PU-4. Using ICT would make it easier to do my job. PU-5. I would find ICT useful in my job.
Perceived Ease of Use (PEU) (Davis 1989 and Davis et al 1989)	The degree to which a person believes that using a system would be free of effort.	PEU-1.Learning to operate Information Communication Technology would be easy for me. PEU-2.I would find it easy to get the Information Communication Technology to do what I want it to do. PEU-3.My interaction with Information Communication Technology would be clear and understandable. PEU-4. I would find Information Communication Technology to be flexible to interact with. PEU-5. It would be easy for me to become skillful at using Information Communication Technology. PEU-6. I would find Information Communication Technology easy to use.
Job-Fit (Thompson et al. 1991)	How the capabilities of a system enhance an individual's job performance	JF-1 I would find the Information Communication and Technology useful in my job. JF-2 Using the Information Communication and Technology enables me to accomplish tasks more quickly. JF-3 Using the Information Communication and Technology increases my productivity. JF-4 If I use the Information Communication and Technology, I will increase my chances of getting a promotion.
Social Influence (SI) (Ajzem 1991; Davis et al, 1989)	The Person's perception that most people who are important to him think he should or should not perform the behavior in question (Azjen, 1991; Fishbein and Azjen 1975).	SI-1. People who influence my behavior think that I should use e-Commerce and Information SI-1.People who influence my behavior think that I should use Information Communication and Technology. SI-2.People who are important to me think that I should use Information Communication and Technology. SI-3.In general, the organization has supported the use of the system.
Facilitating Conditions (FC) (Thompson et al. 1991)	Objective factors in the environment that observers agree make an at easy to	FC-1. I have the resources necessary to use Information Communication and Technology. FC-2. I have the knowledge necessary to use Information Communication and Technology.

	do, including the provision of computer support (Thompson et al. 1991).	FC-3.The Information Communication and Technology I use are not compatible with other technologies I use. FC-4.A specific person is available for assistance with technical difficulties.
Attitude toward using technology (ATT)	Attitude toward using technology is referred as “An individual’s positive or negative feelings about performing and using technology” (Davis Bagozzi, & Warshaw, 1989; Fishbein & Ajzen 1975).	ATT-1 Using Information Communication and Technology is a good idea. ATT-2 The Information Communication and Technology makes work more interesting. ATT-3 Working with Information Communication and Technology are fun. ATT-4 I like working with Information Communication and Technology.
Self-Efficacy	Self-Efficacy in this research is referred as “Judgment of one’s ability to use a technology, e.g., computer, telephone, to accomplish a particular job or task” (Bandura, 1986; Compeau and Higgins, 1995).	SE-1I could complete a job/task using the technologies... SE-2 If there was no one around to tell me what to do as I go. SE-3 If I could call someone for help if I got stuck. SE-4If I had just the built-in help facility for assistance.
Anxiety	Anxiety in our research is referred as “Evoking anxious or emotional reactions when it comes to performing using the ICT” (Bandura, 1986 and Compeau and Higgins, 1995).	AX-1 I feel apprehensive about using the technologies. AX-2 It scares me to think that I could lose a lot of information using the system by hitting the wrong key. AX-3 I hesitate to use the system for fear of making mistakes I cannot correct.
Human Capital	Changes in persons that bring about skills and capabilities that	Open Question 1: Average Spent on Training and Education Per Employee

	<p>make them able to act in new ways (Coleman, 1988). Also, human capital can be described as all the competencies and commitment of the people within an organization (Ceridian UK Ltd., 2007) .</p>	
<p>Development of Small business</p>	<p>Diversity of approaches to sustainable development; some are very market-led and involve pricing nature, while others involve putting environmental protection at the heart of policy</p>	<p>Open question 2: Average Profit Per Employee</p>



## APPENDIX D-IRB APPROVAL LETTER



NEBRASKA'S HEALTH SCIENCE CENTER

Office of Regulatory Affairs (ORA)  
Institutional Review Board (IRB)

October 1, 2012

Jie Xiong  
ISQA  
UNO – Via Courier

IRB #: 180-12-EX

**TITLE OF APPLICATION/PROTOCOL: Cross Country and State Level Analysis of e-Commerce Adoption Between Small Businesses in China and the United States**

Dear Jie Xiong:

The Office of Regulatory Affairs (ORA) has reviewed your application for **Exempt Educational, Behavioral, and Social Science Research** on the above-titled research project. According to the information provided, this project is exempt under 45 CFR 46:101b, category 2. You are therefore authorized to begin the research.

It is understood this project will be conducted in full accordance with all applicable HRPP Policies. It is also understood that the ORA will be immediately notified of any proposed changes that may affect the exempt status of your research project.

Please be advised that this research has a maximum **approval period of 5 years** from the original date of approval and release. If this study continues beyond the five year approval period, the project must be resubmitted in order to maintain an active approval status.

Sincerely,

A handwritten signature in cursive script that reads "Gail D. Kotulak".

Gail Kotulak, CIP  
IRB Administrator  
Office of Regulatory Affairs (ORA)

gdk

July 22, 2013

Jie Xiong  
ISQA  
UNO – Via Courier

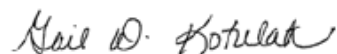
IRB #: 180-12-EX  
TITLE OF PROTOCOL: Analysis of IT Adoption in Small Business in the United States and China:  
Adoption Decision, Human Capital, and Sustainable Development  
RE: Request for Change, dated July 17, 2013

Dear Jie Xiong:

The UNMC IRB has completed its review of the above mentioned Request for Change modifying the title, and adding new literature to aid in the analysis.

This letter constitutes official notification of IRB approval of the revised *IRB Application*. You are authorized to implement this change accordingly.

Respectfully Submitted,



Gail Kotulak, BS, CIP  
IRB Administrator  
Office of Regulatory Affairs

April 02, 2014

Jason Jie Xiong  
ISQA  
UNO – Via Courier

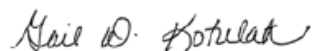
IRB: 180-12-EX  
TITLE: Information and Communications Technology Development for Native American Small  
Businesses and Microenterprises with a community Emphasis  
RE: Request for Change, dated March 24, 2014

Dear Jason

The UNMC IRB has completed its review of the above mentioned Request for Change to modify the title and update the literature review in the background and reference section.

This letter constitutes official notification of IRB approval of the revised application. You are authorized to implement this change accordingly.

Respectfully Submitted,



Gail Kotulak, BS, CIP  
IRB Administrator  
Office of Regulatory Affairs