

8-5-2011

# DEFINING ICT AND SOCIO-ECONOMIC DEVELOPMENT

M. Neveed Baqir

*University of Delaware, mnbaqir@udel.edu*

Prashant Palvia

*The University of North Carolina at Greensboro, pcpalvia@uncg.edu*

Hamid Nemati

*University of North Carolina at Greensboro, nemati@uncg.edu*

Kathleen Casey

Follow this and additional works at: [http://aisel.aisnet.org/amcis2011\\_submissions](http://aisel.aisnet.org/amcis2011_submissions)

---

## Recommended Citation

Baqir, M. Neveed; Palvia, Prashant; Nemati, Hamid; and Casey, Kathleen, "DEFINING ICT AND SOCIO-ECONOMIC DEVELOPMENT" (2011). *AMCIS 2011 Proceedings - All Submissions*. 364.

[http://aisel.aisnet.org/amcis2011\\_submissions/364](http://aisel.aisnet.org/amcis2011_submissions/364)

# ICT AND SOCIO-ECONOMIC DEVELOPMENT IN PAKISTAN

## USING NARRATIVE RESEARCH

### ABSTRACT

There is a widespread belief that information and communication technologies (ICT) can play a significant role in the socio-economic development of a nation. ICT has the potential to affect many aspects of economic and societal activity such as GDP growth, employment, productivity, poverty alleviation, quality of life, education, and healthcare. While the literature from various disciplines provides a myriad of definitions and elements of socio-economic development, the fundamental question of what constitutes socio-economic development, specifically one that is ICT-driven, *from the perspective of ordinary citizens*, remains unanswered. This study focuses on the citizens' view in describing ICT-driven socio-economic development in a developing country. The paper also makes a methodological contribution to the IS field by its use of the *narrative research method*, one which is very appropriate for this type of research. Narratives allow deeper and profound insights into participants' beliefs about the role of ICT in their socio-economic development. Using the narrative research method, a model of the dimensions of socio-economic development is formulated. Furthermore, the research introduces several innovations in qualitative research.

### ***Keywords***

Socio-Economic Development, Narrative Research, ICT for Development, Dimensions of Development

## INTRODUCTION

Information and communication technologies (ICT) are often presented as a factor in global socio-economic development. There is a widespread optimism that ICT can play a significant role in economic development, GDP growth, capacity development and employment, productivity and organizational restructuring, poverty alleviation and democratic participation of citizens (Kozma, 2005). ICT are also expected to have an important impact on transparency and responsiveness of governmental agencies, education and healthcare opportunities, cultural creativity, and social integration of individuals with diverse cultural backgrounds. However, the fundamental question of what constitutes socio-economic development from the perspective of ordinary citizens remains unanswered. The contrast between the definitions of socio-economic development from academic disciplines such as sociology, political science, geography, medical science and others is great and sometimes limiting.

The concept of socio-economic development is not new to information systems (IS) researchers. It was first referred to in an article on “computers and the frustrated chief executive” (Danzgler, 1977). Hardy’s (1980) research on telephones for economic development was another step towards realization of the importance of ICT in socio-economic development. Orlikowski and Iacono (2001) referred to information technology as the centrality in everyday socio-economic life. Quoting Walsham’s (2001), Puri (2007) discussed the role of ICT in creating a better world and referred to socio-economic development as a means to advance the less developed countries. Hsieh, Rai and Keil (2008) analyzed behavior models of socio-economically advantaged and disadvantaged to understand digital divide. While the term socio-economic development is widely used, its conceptualization ignores the perspective of ordinary people. A concept as complex as socio-economic development is sometimes measured only in terms of income and education (Hsieh et.al. 2008). Even when Puri (2007) talks about socio-economic development as a possible way of creating a better world, he does not provide details

of what it entails. Madon's (2000) work on dimensions of socio-economic development probably comes as close as possible to understand and conceptualize socio-economic development in the broadest possible context. Her dimensions of socio-economic development include social wellbeing, economic growth, political wellbeing, and physical environment.

This situation warrants an in-depth study of how ICT based socio-economic development is understood by those who it impacts the most, i.e., the citizens of a country. In order to accomplish this task, qualitative research was undertaken that provided the most suitable tools for this endeavor. Narratives of citizens about what they considered socio-economic development were collected in three phases in a developing country. The analysis of these narratives yielded a grounded model of socio-economic development.

During the course of this research, several sound and sometimes innovative methods, tools, techniques were developed. This paper not only reports on the findings of the research but also describes the *narrative research method* in detail. It also introduces new methods and techniques that were developed during this research and discusses several innovative uses of the qualitative method. The intent is to provide guidelines as well as an exemplar of narrative research.

## **LITERATURE REVIEW**

In order to define socio-economic development, it is appropriate to first understand *development* and a closely associated and sometimes interchangeably used term *growth*. However, the distinction between these two terms becomes apparent when the concept of horizontal expansion and vertical advancement is considered (Jacobs et.al, 1999). Development is defined as progressive course of growth (Oxford English Dictionary, 2010). Growth is horizontal expansion in which, for example, service area for ICT might be increased by putting more cellular towers, laying more network cables, or allowing people in far off places to connect to internet hubs. This is sometimes referred to as infrastructure development or growth.

Development represents vertical advancement where society moves from lesser to greater levels of energy, efficiency, quality, complexity, comprehension, creativity, enjoyment and accomplishment (Jacobs et.al, 1999).

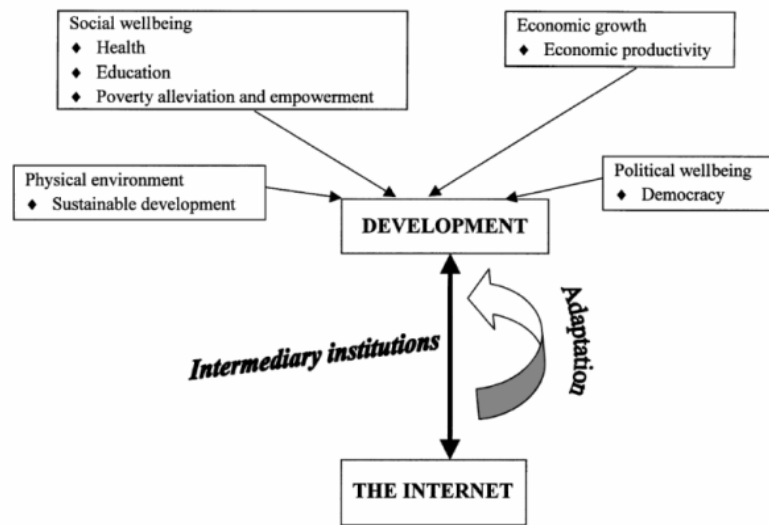
Several theories explain the process of development in developing countries, e.g., modernization theory (Rostow, 1990), dependency theory (Amin, 1976), world systems theory (Wallerstein 2004), state theory (Preston, 1996), economic development theory (Abbott, 2003), the comprehensive theory of social development (Jacobs et.al., 1999) and social development theory (Szirmai, 2005; Kozma, 2005; Houtman, 2004). Social development, in its simplest form, refers to opportunities for education, social interactions and evolution of social customs, fashion and trends (Blakely, 2000). Economic development on the other hand means creation of (better paying) jobs, widespread and sustained increase in living standards and accelerated economic activities (Blakely, 2000). The World Bank defines economic development as “qualitative change and restructuring in a country's economy in connection with technological and social progress”. The main indicator of economic development is increasing GNP per capita (or GDP per capita) (World Bank, 2010). While these theories weave the threads that explain social and economic development, they fail to provide an empirical basis for what constitutes socio-economic development. Table 1 provides definitions of socio-economic development from different disciplines.

**Table 1. Definitions of socio-economic development from various academic disciplines**

<b>Discipline</b>	<b>What is Socio-Economic Development?</b>	<b>Literature</b>
Economics	Socio-economic development is a “potpourri of economic, social, cultural and political forces”	Lewis, 1954
	Various dimensions of socio-economic development that are considered vital include grassroots development such as entitlement, empowerment, entrepreneurship, well-being and sustainability. Poverty is viewed as vulnerability and lack of voice, power and representation	Choudhury, Zaman & Harahap, 2007
Sociology	Individual income as well as contextual income such as GDP, education, information, freedom of choice, social stability, autonomy, and social values such as power, security, achievement, hedonism (aspiration), stimulation, self-direction, conformism/tradition and benevolence/goodness	Ramos, 2006
	development in income, education, human capabilities, politics, culture, ecology, nutrition, health, life expectancy, personal dignity, freedom of association, personal safety and freedom from fear of physical harm, and the extent of participation in civil society part of socio-economic development	Szirmai, 2005
Political Science	Broad and equitable improvements in material and social welfare of people	Goldsworthy, 1984
	Economic power, wealth, income, direct and indirect economic benefits in the form of (better paying) jobs, better living standards and accelerated economic activities	Blakely, 2000
Geography	Natural resources, income, infrastructure, health, poverty, infant mortality, child nutrition, inequality and social cohesion combined explain the socio-economic development of a region, country and society. Geography deeply impacts socio-economic development. It becomes an important and interesting concept when the impact of altitude, urbanization, rainfall, distance to market, sea, rivers, population density, quality of public administration, general level of health and diseases are discussed in relation socio-economic development.	Gallup, 2000
	Issues such as social capital, civil society and participatory development and economic development	Potter et al., 2004
Climatology	Socio-economic development is defined as complex social challenge including life-expectancy, educational achievement, quality of governance (political stability, level of corruption) and disparities in per capita income.	Kaivo-oja and Rikkonen (2005)
Medical Science	Socio-economic development is considered means of inequality in access to healthcare, service use and outcomes. Medical science’s view of socio-economic development includes understanding of the poverty levels, social justice (and inequalities), education, health care access, service use and ability to pay	Ahmed, Adam, Chowdhury & Bhuiya, 2000
Information Systems	Education and income level are used to define socio-economically advantaged and disadvantaged.	Hsieh et al., 2008
	Dimensions of socio-economic development include social wellbeing, economic growth, political wellbeing, and physical environment	Madon, 2000

Madon’s (2000) theoretical model attempts to define the concept of socio-economic development in developing countries as well as its dimensions within the context of Internet growth. She identified four dimensions of socio-economic development: social wellbeing, economic growth, political wellbeing, and physical environment. Several application areas are identified within these dimensions, i.e., economic productivity, health, education, poverty alleviation and empowerment, democracy, and sustainable development (Figure 1).

There seems to be no consensus from the literature as to what constitutes socio-economic development. Particularly, there is a lack of empirical evidence about what citizens in developing countries consider socio-economic development from their own perspectives. A better understanding of socio-economic development from the citizens' perspectives will not only be of academic value but also help in national and international planning that targets growth and socio-economic development. This research specifically focuses on the role of ICT in the socio-economic development of citizens in a developing country, namely Pakistan. Furthermore, a qualitative research method allows for an in-depth understanding of this phenomenon.



**Figure 1. Internet and Socio-economic Development (Madon, 2000)**

### **THE NARRATIVE RESEARCH METHOD**

The use of narrative research in IS has been limited although there have been some recent publications (Alvarez & Urla, 2002; Davidson, 1997; Dube & Robey, 1999, Hirschheim & Newman, 1991). Table 2 lists some of these studies. However, the clear understanding of how to conduct, interpret and describe narrative research in the context of information systems does not exist and is being provided in this paper. Below we explain the theoretical foundations and key elements of narrative research and present an exemplar of the application of this method.

**Table 2. Narrative Research in IS**

<b>Authors</b>	<b>Research Title</b>	<b>Publication</b>
Bartis, E., Mitev, N. (2008)	A multiple narrative approach to information systems failure: a successful system that failed	European Journal of Information Systems, (17:2), p. 112
Joseph, D., Kok-Yee Ng; Koh, C., Soon Ang. (2007)	Information Technology Professionals: A Narrative Review, Meta-Analytic Structural Equation Modeling, and Model Development	MIS Quarterly, (31:3), p547-577
Kuechler, W. L., Vaishnavi, V. (2006)	So, Talk To Me: The Effect of Explicit Goals on The Comprehension of Business Process Narratives	MIS Quarterly, (30:4), p961-A16
Chae, B., Poole, M.S. (2005)	The surface of emergence in systems development: agency, institutions, and large-scale information systems	European Journal of Information Systems, (14:1), p. 19
Roy, M. C., Lerch, F. J. (1996)	Overcoming Ineffective Mental Representations in Base-rate Problems	Information Systems Research, (7:2), p233-247

The basic idea behind narrative research method is that all people can tell stories.

Storytelling is a universal social activity that we are taught as children learning to speak.

Specifically, for the purpose of studying socio-economic development:

*an especially appealing attribute of (narrative research) is the way in which it can display the assets of those usually considered to have none. A lack of academic learning does not preclude expertise in narrative knowing or skill in narrative expression (Casey, 1996),*

So narrators from a variety of circumstances, including illiterate, highly literate, younger folks and older people in urban and rural areas can become research participants.

The collection and analysis of stories adds a dimension missing in other methodologies. Participants' narratives are not only valuable for the information they provide; they also allow us to see socio-economic development through the eyes of those whose lives are changed by it. The researcher's perspective can be enlarged or even changed by the interpretations of those at the grassroots of development. The significance of narrative is that

*its information comes complete with evaluations, and explanations and theories, with selectivities and silences, which are intrinsic to its representation of reality. (Narrative research), in all its rich wholeness, will illuminate conscious human activity in a way positivism never can. (PMG in Casey, 1993)*

Narrative research is also useful for studying the perceptions of various social groups.

Because communication is a social activity, children are initiated into particular social identities



as part of specific social communities with their own perspectives and ways of interpreting experience. “*Studying narratives is... useful for what they reveal about social life; culture ‘speaks itself’ through an individual’s story*” (Reissman, 1993). The term “*social dialect*”, (Casey, 1993) refers to commonalities of vocabulary, grammar, values and beliefs which can be found in the transcribed narratives of members of the same social group. These commonalities constitute the elements of a “*cultural framework of meaning*” (Casey, 1996). To receive the full benefits of narrative research, the researcher must allow participants to answer a broad question instead of responding to a fixed interview protocol. This permits the speakers to set their own agenda, and respond in their own words, without interruptions from the researcher (Casey, 1996, Riessman, 1993, and Peshkin, 1988). In this study, a brief overview of the research was followed by the open-ended question. “I am studying the role of ICT in socio-economic development; please tell me the story of your life.” The goal is to provide the storytellers with flexibility and choice to narrate the story in a way that is most comfortable to them.

According to Riessman (1993), there are five steps in conducting and analyzing narratives:

**Attending.** This deals with the notion of how a storyteller reflects, remembers, and recollects the “*primary experience*”. It is important to pay attention to how a storyteller makes sense of an experience, the context of the experience itself, and his/her selectivity of the experience.

**Telling.** The “*performance of a personal narrative*”. A storyteller sequences and orders the events of the experience in a particular way. Meaning is constructed by the storyteller about his/her experience at this level. The narrative method allows for flexibility in how the story is communicated. While oral tradition is the oldest form, other expressions such as biography, story, novel, essay or even a drawing could communicate how people interpret a phenomenon.

**Transcribing.** This step refers to choice of putting words into text/language, “*a fixation of action*” for interpretation. This step does not necessarily mean literal textual transcription but a

way of keeping sequential record of the narrative. A video-recording of the narrative (or audio-recording) does even a better job than a literal transcription because it can preserve the contextual richness related to body language and interview environment. Similarly, a drawing or a portrait may be a more powerful expression of the artist's mind than words.

**Analyzing.** The analysis of a narrative may employ qualitative techniques such as identification of codes and categories. Higher level categories may be developed by combining related codes. This represents an increasing level of abstraction. The abstract categories are scaled up to develop broader level themes. However, this is where similarities with other qualitative analysis techniques end. Analysis of a narrative encompasses understanding of a statement (or a quotation) within the background and context of the story teller. This emphasizes the need to focus on the whole story and not just the dissected parts of the story.

When analyzing the narratives, the following concepts are essential:

***Selectivity.*** The story of one's life is necessarily a short version of a life time of experiences. The narrator chooses to focus on personally significant events. The selection of what the narrator chooses to tell is a clue for the researcher to discover what is really important in an individual's life.

***Silence.*** Narrators may choose to keep quiet about some parts of their lives. These omissions can be clues to either less important things in a person's life, or to suppressed memories of negative experiences which the narrator does not feel comfortable talking about.

***Slippage.*** Contradictions within or between narratives are called slippage; slippage may occur because of conflicting beliefs or actions on the narrator's part. Identifications of slippage and their explanation are crucial for the appropriate analysis of narratives.

***Intertextuality.***

Different narratives can be compared and contrasted with each other to help identify *selectivity, silence and slippage*. The researcher can identify patterns in the text by focusing on repetitions, hesitations, sequences, chronology, choice of vocabulary, expressions/emotions/values, and use of metaphors is crucial. Moreover, the analysis of narratives may also include a comparison of the texts with historical or official versions.

**Reading.** Listeners or readers bring another layer of meaning to the experience and the identity of a storyteller. This means that our understanding of the narrative may be different from what the narrator wanted us to know. This difference comes into play due to difference in the background, personality and experience of the listener and storyteller. The goal is to understand the narrative within the socio-cultural and economic context of the narrator.

### **RESEARCH DESIGN: AN EXEMPLAR USING NARRATIVE RESEARCH**

The data were collected in Pakistan. There are several reasons for selecting Pakistan for this research. First, while a developing country, Pakistan is the seventh largest populated country and has the highest one year growth rate of ICT industry (147%) in the world (Willing, 2007). Second, a large portion of the population in Pakistan still lacks access to basic ICT needs such as reliable electric power, and infrastructure. Third, the government has pushed deregulation policy with enabling legislation to facilitate wireless ICT access. It has allowed for cheap and reliable ICT devices, such as third generation mobile phone systems, CDMA 2000, and WiMax devices that enable poor people and those in remote areas to get connected (Mujahid 2002; Gao and Rafiq, 2009). Fourth, a large segment of Pakistani society suffers from the lack of basic resources, illiteracy, and low income. Finally, Pakistan is experiencing an evolving regulatory framework with changes in government policies for the growth of ICT sector since the early 1990s (Baqir and Pervez, 2000; Mujahid, 2002; Gao and Rafiq, 2009). Appendix A provides more details about Pakistan and our research sites.

The selection of citizens is an important step in research design. Cresswell (1998, 2006), Casey (1996) and Reissman (1993) emphasize a purposeful selection of research participants. The concept of theoretical sampling has been popularized in IS which requires qualitative

researchers to carefully choose where to sample the next unit in a given situation (Urquhart, et.al. 2009). The selection of various social groups of participants is crucial in getting the widest possible range of responses.. Therefore a set of four criteria, namely gender, domicile, income and education was used to select the participants in this study.

Gender plays an important role within the cultural and social environment in Pakistan. It usually defines how people think, act and interact with others. Therefore, it is important to include both genders proportionally. However, a total of 26 men and 9 women agreed to participate in the study. The low participation of women is indicative of the socio-cultural norms which inhibit women from voicing their opinions and keeping them within defined socio-cultural boundaries. Even though the number of women is low, the depth of the thought process and richness of their narratives were noteworthy. Casey (1996) suggests including approximately six participants from each category and therefore this number is still considered good.

The government of Pakistan designates rural and urban areas throughout Pakistan and this list was used to categorize participants' domicile as rural or urban and thereby ensure a fair representation. A proportional selection of participants was made on the basis of their income (high, medium, low). Individuals having an annual income within the non-taxable range were considered low income. Non-taxable range of annual income usually includes people below the national poverty line. In 2008, it was Pak Rupees 100,000 (about \$1300) (Central Board of Revenue, 2008). Participants with annual earnings of Pak Rupees 500,000 (about \$10,000) are considered high income and are among the top 5% of Pakistani population. Citizens in between these limits are categorized as participants with medium income. The level of education allows us to capture the level of comfort in using technologies that rely on reading and writing (particularly in English). People with at least a bachelor's degree are considered highly educated, and with no formal schooling are considered illiterate. Those between these limits are participants with medium level of education.

As per the narrative research method, no formal interview protocol was used in order to allow flexibility in the way citizens choose to present and sequence their stories. A brief overview of the research was followed by the open ended question: “I am studying the role of ICT in socio-economic development; please tell me the story of your life”. Narratives were collected from 35 research participants in four languages: English, Urdu, Siraiki and Punjabi. Some interviews lasted as long as 8 hours. Theoretical sampling was used to ensure a representative involvement of participants from different socio-economic and cultural backgrounds. A qualitative method was used to analyze the contents of these interviews. Identification of codes and categories within the narratives was done using the grounded theory method.

**Table 3. Research Design**

<i>Research Participants</i>	<i>Data Collection Method</i>	<i>Time/Space per participant</i>	<i>How were research participants selected</i>	<i>Data Collection Protocol</i>																														
Citizens	35 Interviews	1 to 8 hours per interview	<ul style="list-style-type: none"> <li>• Gender (Men, Women)</li> <li>• Domicile (Urban, Rural)</li> <li>• Education (High, Medium, Low)</li> <li>• Income (High, Medium, Low)</li> </ul> <table border="1"> <thead> <tr> <th colspan="2"><i>Gender</i></th> <th colspan="3"><i>Income</i></th> </tr> <tr> <th>Men</th> <th>Women</th> <th>High</th> <th>Medium</th> <th>Low</th> </tr> </thead> <tbody> <tr> <td>6</td> <td>9</td> <td>4</td> <td>13</td> <td>18</td> </tr> <tr> <th colspan="2"><i>Domicile</i></th> <th colspan="3"><i>Education</i></th> </tr> <tr> <th>Rural</th> <th>Urban</th> <th>High</th> <th>Medium</th> <th>Low</th> </tr> <tr> <td>19</td> <td>16</td> <td>7</td> <td>12</td> <td>16</td> </tr> </tbody> </table>	<i>Gender</i>		<i>Income</i>			Men	Women	High	Medium	Low	6	9	4	13	18	<i>Domicile</i>		<i>Education</i>			Rural	Urban	High	Medium	Low	19	16	7	12	16	Unstructured - Grand Tour Question
<i>Gender</i>		<i>Income</i>																																
Men	Women	High	Medium	Low																														
6	9	4	13	18																														
<i>Domicile</i>		<i>Education</i>																																
Rural	Urban	High	Medium	Low																														
19	16	7	12	16																														
Citizens	Two focus groups of 5 highly educated and 6 illiterate citizens from urban and rural area respectively	90 Minutes per focus group	<ul style="list-style-type: none"> <li>• Focus groups based on Education and Domicile</li> <li>• Representatives from urban area were highly educated.</li> <li>• Representatives from rural area were illiterate.</li> </ul>																															

Additionally, two focus groups were utilized to understand the collective sense-making of the role of ICT in citizens’ lives. One focus group was conducted in Islamabad, a large metropolitan, and involved highly educated research participants. The second focus group was conducted in a rural area and involved illiterate citizens. The interviews were recorded on video

tape except in two cases where video recording was not possible. Table 3 provides details of the research design.

The data collection was risky, expensive and time consuming. Pilot studies were conducted during December 2006 - January 2007 and April - May 2008. Final data collection took place during December 2008 - January 2009. The gap between these periods allowed for moments of pause and reflection. It also allowed us to go back to citizens who were interviewed in earlier phases and observe change in their use of ICT. Table 4 provides details of data collection time frames.

**Table 4. Data Collection Time Frame and Number of Participants**

Data Collection Method	How were they selected	Data Collection Timeframe			Total Research Participants
		December 2006 – January 2007	April 2008 – May 2008	December 2008 – January 2009	
Interview	Gender, Domicile, Education, income	6 Interviews	9 Interviews	20 interviews	35
Focus Group	Domicile, Education	-	-	2 focus groups (5 and 6 participants respectively)	11
<b>Total</b>		6	9	11	<b>46</b>

An understanding of the personal backgrounds of the participants provides insight into their beliefs and the social construction of their life experiences. Select backgrounds and narrative summaries are provided in Appendix B.

### **ANALYSIS AND FINDINGS**

The analysis is based on the guidelines of narrative research. With consideration for selectivity, silence, slippage, reading and intertextuality, codes and categories were identified using the NVIVO software. Higher level categories were developed by combining related codes. This represents an increasing level of abstraction. These abstract categories were scaled up to develop broader level themes that are referred to as dimensions of socio-economic development. The identification of these dimensions is a significant contribution to the literature on socio-

economic development as it enhances our understanding of the concept from citizens' perspective.

### **Dimensions of Socio-Economic Development**

From the qualitative analysis of narratives, a total of 1229 codes were identified which, through the process of hierarchical aggregation, were categorized into five dimensions. These dimensions are grounded in qualitative data and provide an understanding of what socio-economic development means to citizens. Table 5 provides details on code categories, key terms and phrases, and the dimensions. Each dimension is described and discussed further.

#### **Social Contact (*I don't cry anymore*)**

Social contact is the ability of a person to stay in touch with family and friends. While social contact may be defined in a number of ways, it is defined herein in terms of what research participants used, i.e., staying in touch with family and friends, developing new friendships, and replacement of pen-pals with SMS buddies. The highest frequency of codes (367 or 30%) related to this dimension shows that social contact was very important for the research participants.

An educated urban woman, whose children live abroad, narrated an emotional personal story. She had not seen one of her sons in several years. She used to wait for the weekends so that her children can call her. The international call was expensive and she could only speak for a few minutes. She used to cry during the week and anxiously counted days until the weekend. She said:

*I used to cry too much and my husband always told me that our children abroad are studying and doing very well. They take care of us; they call us and visit us frequently. The youngest one has not visited me in years. He loves me very much but his work visa application is in progress and he cannot come to see me until it is complete. I miss him too much and when I think about him, my eyes start shedding tears. I cannot stop missing him.*

**Table 5. Dimensions and Code Categories of Socio-Economic Development**

Dimensions of Socio-Economic Development	Categories of Codes	Code Frequency	Key terms and phrases
Social Contact	Staying in touch with family and friends, Develop new friendships, replacement of pen-pals to SMS buddies	367 (30%)	“Now I can keep in touch with my family whenever and wherever I go”, “I don’t cry anymore; I can speak with my children as much as I want without worrying about the bill”, “I sometimes see my children [living abroad] on a webcam as well”, “the ability to stay in touch with family alone is the most important blessing that comes with owning a cell phone”, “when I am on a business trip abroad, I can still see my 5 and 2 years old girls on webcam and they can see me too; ICT keep us united even when we are physically apart”, “I probably would not be pursuing higher education if I didn’t have a cell phone and my parents didn’t feel that they can keep in touch with me anytime they wanted.”
Economic Transformation	Effective management of current business, Increased business opportunities, New business opportunities, Status of old business	289 (23%)	“my costs of doing a business have gone down because I don’t need to rent a shop anymore”, “My business has expanded several folds since I started using a phone and email to keep in touch with my suppliers”, “I do more business and my customers never have to leave their place to come see me. They just call me and I am there for a service in a few minutes”, “I have just hired three employees to look after my current business and I am now starting a new business”, “I had a public call office (PCO) in a village and made tons of money but for the last three years, I have shut it down and started a new business; no one uses PCO anymore; everyone has a cell phone.”
Quality of Life	opportunities for education and learning, opportunities for healthcare, participation in the political process, self-fulfillment, self-efficacy, self-empowerment, news and media, entertainment	254 (21%)	“I probably would not be pursuing higher education if I didn’t have a cell phone and my parents didn’t feel that they can keep in touch with me anytime they wanted”, “I use online library to find research papers to support my literature review”, “I frequently send SMS [short messaging service] to TV channels that display my message on current affairs at the bottom of the screen; I feel my SMS gives me voice and I can say things I believe in”, “I have not bought a news paper in years; I get my news on internet and TV”, “I love live coverage of political issues; it gives me a sense of involvement and I feel I am learning and participating.”
Cultural Evolution	Changes in social behavior, Westernization/globalization of culture, Family life, Respect for others, Addiction of ICT use, Nuisance, Pornography, Waste of time, Unnecessary expense, Lack of attention, Lack of Privacy	126 (10%)	“I have seen a lot of girls and boys making out on phone and even deciding on marrying without their parents’ approval; this is very bad”, “People see icons of Western culture, try to adopt their style and act like them too... this is a big threat to indigenous culture and values”, I cannot concentrate on anything because of I am always getting emails and SMS – even in the middle of the night”, I cannot go to a park or anywhere else and have a quiet time; phones keep ringing everywhere”, “only time I get relaxed is when I shutdown my computer and cell phone.”
Personal Security and Criminal Use	Sense of security, peace of mind, harassment, Sexual misconduct, fear of being robbed, Stealing, Online Fraud, ICT use for Criminal Activities	193 (16%)	“Even if I don’t have to call anyone, my cell phone gives me a sense of security that I am not alone”, “cell phones give peace of mind that you can call anyone if you are in trouble”, “I was once robbed; all this other dude wanted was my cell phone”, “I know it is wrong to steal money to pay for my cell phone bill but I cannot help it”, “a lot of online ‘scamsters’ would try to rip you off if they found out that you were an easy victim”
Total codes		1229 (100%)	



She did not believe when she heard of special international calling packages that allowed her to make international calls at local toll rates. She explained:

*I don't cry anymore; I can speak with my children as much as I want without worrying about the bill. I call them almost every morning. I can actually call them anytime I want but I understand that they might be busy. So, I only call them in the morning which is evening for them.*

An executive of a software development house who frequently travels internationally narrated an emotional and powerful personal story. He travels for weeks leaving his two little girls, wife, and old parents back home. His ability to stay connected with his family is an important aspect of his ICT use. He explained:

*When I am on a business trip abroad, I can still see my 5 and 2 years old girls on webcam and they can see me too; my mother does not feel that I am away because she can still see me and speak with me every night before she goes to her bed. ICT keep us united even when we are physically apart.*

The use of ICT for staying connected is not limited to educated participants in urban areas alone. From illiterate farmers in rural areas to blue-collar workers in Multan and Islamabad, the ability to stay in touch with family is the most important aspect of everyday ICT use. However, for illiterate people, the scope of devices that they can use usually remains limited to cell phones. Cell phones are readily available, easy to carry and cheap (cell phone is available for under \$20 – 1500 rupees – and the cost of ownership is as low as a couple of dollars each month). It makes these devices ideal for use by people with little or no education. Furthermore, the use of cell phone is not limited to voice communication alone. The use of Short Messaging Service (SMS) and Multimedia Messaging Service (MMS – that allows transmission of files, photos and videos) was quite common among illiterate research participants.

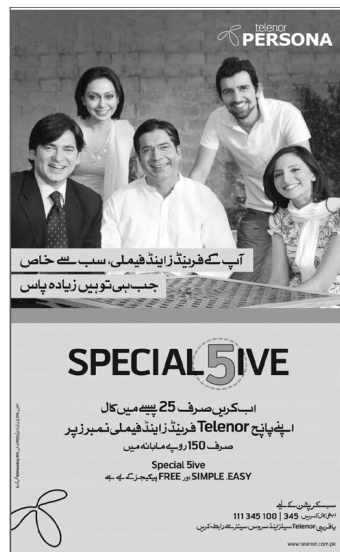
An illiterate research participant, who is a honey farmer, travels great distances to find flowers. His job requires him to stay away from his family for months. His cell phone allows him to keep in touch with his wife and parents. He said:

*I speak with my wife for hours in the night when the service is free. If my mother needs to speak with me, she can always find me. I cannot read but a friend of mine has shown me how to take a photo on my cell phone and send it to someone else. I do send photos of new places to my family that I discover in search of flowers for bees.*

The concept of friendship was very important to several participants. The stories of meeting someone at a bus stop or elsewhere and then staying in touch with them were credited to ICT. A young participant said:

*I love making friendships. I used to have 20 pen-pals when I was in school. I have not written a single letter in three years now and I have more friends now. When I SMS a joke, or forward an email, sometimes there could be as many as 300 receipts. I have a facebook page and my family and friends in other cities and abroad know whatever goes on in my life at work and home. I just love it all and I cannot imagine how anyone else can live without these things.*

Evidence from narrative research can be corroborated from other sources. Further evidence of the importance of this dimension comes from a review of ICT service providers' advertisements in national newspapers. These advertisements offer special calling rates and ease of use features in staying in touch with friends and family. Figure 2 shows one such advertisement.



**Figure 2. A Newspaper Advertisement of a Cellular Service Provider Offering**

## **Economic Transformation (*I can earn as much as I want*)**

Economic transformation not only refers to economic productivity but also to increase in market size of existing businesses, new business opportunities and demise of some old businesses. This concept emerged as an important theme across participants from different backgrounds; it had 289 or 23% of the codes associated with it.

The use of ICT (such as cellular phones, internet, television) to support economic transformation was unique as well as interesting. One participant, who hauls loads on his donkey driven cart from warehouses to furniture showrooms when someone makes a purchase, narrated the following:

*The owner of the showroom would go and peek out of his place to see if someone with a donkey cart was there. There are a lot of people searching for work around the furniture market. I get paid only when a customer makes a purchase at a showroom, and I am available to bring furniture from the warehouse. I am not too lucky and most of the time others who are standing nearby will grab the job before I even know about it.*

Then he got a cell phone. He cannot read, even numbers (so he visually matches patterns for a number on a piece of paper to the dial pad of his phone). However, he got some help which changed the dynamics of how he gets a job at the furniture market. He explained:

*Someone helped me with setting up the phone for distinctive ring tones. Showroom owners give me a missed call, and I can recognize who needs my help by a specific ring tone setup for a particular showroom owner. Now, I can work as much as I want.*

This innovative way of using cell phones to manage small businesses is not uncommon. Another illiterate participant who runs five-passenger vans for public transport said the following:

*I have been in public transport business for about ten years. There are several other people who are in the same business. I cannot afford to buy new vans and the older vans sometimes breakdown in middle of transporting customer. The fierce competition and low profit margins affect customer service. When a van breaks down, there is not much that the driver [his employee] can do except to help passengers get a seat on one of my competitors' vans. That makes me lose all the fare money my driver had collected. I am mechanic myself but since I do not even know what happened to the van, the driver would have to get it fixed from someone else. That was*

*a big expense. On the top of everything else, my van is not making me money until it is fixed and who knew how much time it might take before it gets back to business.*

Since he got a cell phone for himself and his employees, his business runs relatively smoothly and he has raised the level of customer service. He said:

*I can keep in touch with my employees and know exactly where they are when a van breaks down. I can go and fix it myself. My employees do not have to run here and there to find another mechanic. To better serve my customers, I can dispatch a replacement van right away. It is a win-win situation for me, my employees, and my customers.*

In several cases, ICT proved helpful in developing new business ideas as well. One participant was making a pulley system for a machine that could be used in construction or agriculture business to fetch loads or water. He explained how a TV program about making mechanical systems inspired him to make the pulley system. He shared the news that he has already found a customer who wants him to deliver this machine as soon as possible.

ICT growth has played an important role in changing the nature of competition. Those with knowledge to use computers and internet have discovered new products and markets to sustain and transform their business. An educated participant who owns a small mechanical parts manufacturing facility in a small urban area shared his success stories. His father opened a mechanical workshop to fix and retool mechanical parts of tractors several years ago. The agriculture based economy of the region meant a thriving mechanical repairs business in the 1980s and 1990s. However, the competition has increased and it is difficult to make a reasonable living within the existing business. He said:

*My father was the first person who opened up a mechanical workshop in this town. We did a lot of good business. We had to hire a lot of employees to keep up with the amount of work. These 'boys' would learn how to use machines here and a few weeks later, they would open up their own shop next door. Let me give you an example. We were the first ones to bring a diesel testing laboratory in the town. Now there are many other diesel testing labs that you can get a job done for 300 rupees today [in 2009] for which we used to charge 600 rupees in 1995.*

Therefore, they decided to start a mechanical parts manufacturing business in 2002. They did not want to hire employees for the fear that the employees will open up same or similar business independently. They kept the manufacturing knowledge to their own family members. The demand for their parts grew steadily between 2003 and 2007. In order to keep up with the demand, he and his family decide to explore options to automate their manufacturing business. In late 2007, he imported a used machine which could be used to automate the manufacturing process. However, the machine had missing parts and was not in operational condition.

*We spent a substantial amount of money to buy this old machine... about 300,000 rupees. That's a lot of money for one piece of equipment considering you can open up two manual mechanical workshops for that much money.*

He used the internet to find a manual for this machine, made and fixed some parts and brought the machine to operational condition. The variation in production process has gone down (0.0001% quality rejection rate) and demand has increased significantly (800% in one year). Now, he continuously uses internet, email and cell phone to stay in touch with his clients in different countries.

An illiterate entrepreneur woman shared her stories of success. She has a small cloth sale business in nearby towns. She travels as far away as 300 miles to buy cloth at wholesale prices and sells at profit to villagers who cannot travel. Her business has grown significantly since she got a cell phone because her customers can call and tell her what they want. She can now accept special orders and her customers are very happy. She has expanded her business to farther villages because of her ability to stay in touch with her customers, understand market needs and serve accordingly.

Several business owners are discovering that they can run their business more effectively and cut down on expenses by using ICT. For example, a plumber explained that previously he had to rent a shop just to make sure his customers can find him. With his cell phone, his business card bears his business name and cell phone number alone. He said he has more satisfied customers because they do not have to come to his place to find him.

*My customers just call me on the phone and I can be at their place in no time. It saves me and my customers a great deal of time. I am more accessible and I make more money than I used to when I used to rent a shop. I don't have to pay rent anymore and I can save on my business expenses.*

In some situations, ICT have caused the demise of some types of businesses. As these businesses shut down, some have moved to explore other economic opportunities. For example, a research participant who owned and operated a Public Call Office (PCO) experienced a thriving business in 1990s and early 2000s. He narrated his story as follows:

*I opened up a PCO in this town in 1992. My PCO's phone was the only phone in town and nearby villages where you could go and call someone in another city or country emergencies. The calls were expensive but profit margin was great. I did very well for several years. Then, around 2003 and 2004, my business started to decline because cheap and easily available cell phones became affordable for my customers. I struggled for a couple of years but in 2007 I gave up. For one week, I did not get a single customer in my PCO to make a call. I knew that was it for me in this business.*

Now, he operates a motorbike rental business. This story resonates with demise of several service sector jobs and businesses. Thus ICT growth is also transforming the nature of business.

### **Quality of Life (*My life is more comfortable*)**

The “Quality of Life” dimension was derived from 254 codes representing 21% of all codes. It is a comprehensive dimension comprised of four major sub-dimensions: (1) education and learning, (2) healthcare, (3) political process and role of media, and (4) entertainment. While we list them as sub-dimensions representing different aspects of quality of life, an argument can be made to list them as separate independent dimensions. As background, the use of ICT for educational and learning opportunities has been wide spread. From access to free educational content at several universities to ICT use in traditional education, this trend can be clearly observed. The use of ICT is significant in rural healthcare where patients can call doctors and get advice for minor ailments. Awareness and understanding of the social and political issues have been brought about from the use of ICT such as special interest televisions on current affairs and social issue, internet blogs, online message boards, short messaging service (SMS) and cell phones.

The Virtual University of Pakistan and Allama Iqbal Open University have a wide student base throughout Pakistan and employ ICT such as TV, Internet, radio, and SMS messages to deliver educational content. Lectures and most educational materials are freely available. However, ICT use is limited in traditional institutions where research and teaching material are rarely available on university websites. ICT have created an interesting situation where some students are able to pursue their education because their parents can now keep in touch with them. One young participant who was pursuing graduate level education in Islamabad shared interesting insights about educational opportunities for young girls. Many students, especially girls, are not allowed to go to universities far away from their home towns. This participant excelled in her B.Sc. in 2005 and wanted to pursue a M.Sc. in Microbiology. She said:

*You know, not many universities in Pakistan have a good Microbiology program. I wanted to do my M.Sc. at Quaid-e-Azam University in Islamabad. That is one of the best programs around. But my parents would not allow me to go to a university which is like 800 kilometers from my home... I wasted a year and could not start my graduate studies right after my B.Sc.*

Her parents were concerned of her safety in a city 500 miles away. Cellular phones were becoming popular and things changed for her when they got her a cell phone and found out that they could always stay in touch with her. She said:

*Even though I started my M.Sc. one year later, I am glad I got this opportunity. My parents are very open-minded but they still feared for my safety... I probably would not be pursuing higher education if I didn't have a cell phone and my parents didn't feel that they can keep in touch with me anytime they wanted.*

She accesses a large online library which helps her in research and access to latest publications in her areas of interest. She was also aware of several others who experienced the same struggle for their education in their families.

The role of ICT in healthcare is important in developing countries. Pakistan like other developing countries suffers from the shortage of qualified health professionals. The shortage is even severe in rural areas where natural hazards such as snake bites and hygiene related ailments

are common. A medical doctor shared a number of stories where villagers were able to get his advice for minor ailments on a quick phone call.

The importance of ICT became apparent in the October 2005 earthquake. Thousands of people died in that earthquake and wired telephony systems were severely affected. Mobile cellular units were established in the affected areas and medical camps were setup. However, there were not enough doctors. A participant who volunteered for the relief team said:

*I was among the first responders. The biggest problem was to give medical care of injured. There was only one doctor and thousands of injured people. An internet service provider setup satellite links to doctors in Europe and America who volunteered to assist with the diagnosis and prescriptions for the injured people. Two X-ray specialists ran x-rays for this camp where I was volunteering. I scanned X-rays and emailed those to volunteer doctors abroad. They diagnosed what needed to be done with detailed instructions so people with minimal medical training can run those procedures. We saved hundreds of lives in those few days.*

ICT have played a role in creating political awareness and opportunities for political participation. The special interest TV channels, e.g., news and current affairs channels, encourage viewers to send their opinions on SMS. The SMS messages scroll at the bottom of the screen. Most channels charge significant amount for receiving such messages. While such services allow viewers to say their mind, it is a source of additional revenue for TV channels and the cellular service providers. A participant described his experience:

*I love the live coverage of political issues; it gives me a sense of involvement and I feel I am learning and participating... I frequently send SMS to TV channels that display my messages on current affairs at the bottom of the screen; I feel my SMS gives me voice and I can say things I believe in. I was extremely happy when I saw my message scrolling sideways at the bottom of my TV the first time. I paid 10 rupees for that message but I was very excited to see that others can see what I have to say. I feel as if my voice is heard. I send these messages specially when there is a political debate or a crisis is going on. Initially there used to be few messages but these days a lot of people send messages.*

Politicians used SMS heavily to stay in touch with their constituents especially during the campaigns for elections in 2008. A participant gave his account of excitement when he got an



SMS from his favorite candidate. He said he was going to vote for this candidate anyway but the SMS made him feel closer.

ICT have changed how citizens get news. In addition to news on TV, several providers offer free SMS for breaking news. A number of online news websites are available. A participant narrated:

*I have not bought a newspaper in years. I get my news on internet and TV... I spend quite a bit of time online every day. Sometimes I watch cricket matches and sometimes I even watch movies.*

ICT have increased opportunities for entertainment. The use of internet based entertainment content is limited to those who can afford to buy a computer and pay for internet connection. In some cases, availability of internet in the workplace and universities has created opportunities to download music, movies, and play games. This is also an additional source of revenue for service providers. Cellular service providers have subscription based services as well as pay-as-you-use services for accessing musical ring tones, music libraries, religious music, movies clips, SMS, multi-player games, live games commentary (mostly cricket), and on-demand content. A participant described his experiences:

*I spend about 300-400 rupees [75% of his monthly phone bill] every month on ringtones and music alone. I always use this facility for live commentary when Pakistani team is playing international cricket matches and I am unable to watch the game on TV. My phone does not have video capability and that's why I cannot use MMS services but I am saving money to buy a more expensive phone which has more features. Some of my friends have those phones and they can even watch funny video clips, and movie clips.*

Another participant in a university described the use of internet for watching soap opera:

*My work schedule does not allow me to watch my favorite episodes of TV dramas [soap opera]. Someone told me about a website which has episodes of all the programs I wanted to see. Now, whenever I get a break, I just go online and watch the programs I want to. This is a wonderful facility. That's the extent of what I do online though.*

It is evident from this analysis and discussion of the narratives that ICT have improved the citizens' quality of life in several spheres, thus contributing to their socio-economic development.

## **Cultural Evolution (*this is a big threat to indigenous culture*)**

This dimension is derived from the categories of codes that represent changes in social behavior, westernization/globalization of culture, family life, addiction of ICT use, pornography, nuisance, waste of time, unnecessary expense, and lack of attention. There were a total of 126 codes (10%) representing this dimension. Frequent references to cultural evolution were found in the narratives.

While efforts for localizing and ‘aligning’ technologies to local customs and traditions can be observed, ICT based cultural evolution is inevitable. For some, these are the signs of progress and yet others consider it a threat to the indigenous culture, traditions and customs. Situations where ICT were considered to cause a cultural evolution included issues such as (1) gender segregation, (2) sexual conduct, (3) respect for parents and elderly, and (4) westernization of several institutions. Some of these developments are at odds with local customs, and as such some participants portrayed them negatively.

Some of the situations where ICT were regarded a threat to local customs were representative of the socio-cultural norms of Pakistan. Gender segregation is regarded as a cultural value and a symbol of respect for genders. Intermingling of genders is considered a sign of westernization. For example, a woman in rural area said:

*I have seen a lot of girls and boys making out on phone and even deciding on marrying without their parents’ approval; this is very bad. It was unthinkable to marry without parents’ blessings. Marriage used to be a mystery in several respects for both girls and boys until the day they would get married. Sometimes the bride and the groom would meet for the first time [as in some arranged marriages] and lived happily ever after. Sometimes even when they knew each other in the case of family marriage, ‘silence’ between the two was considered polite, and a show of mutual respect for each other. Things are changing now. It is good that bride and groom understand each other before marrying but I am just surprised on the amount of time girls and boys can spend on phone before parents give them blessings.*

She admits that cell phones are very helpful in several aspects but doesn’t want young girls and boys to be carrying phones around just to waste time in “useless” talk. She sees a major

transformation in the social structure in rural areas where parents are losing control over children in young age due to cell phones.

Intermingling of genders is not considered inappropriate in the developed world. It is common to expect boys and girls to have intimate relationships without parents' consent and approval. Thus ICT may bring about cultural evolution that is not approved by many citizens. ICT growth has increased access to what was considered “*outside culture*” by many participants. From comments on TV programming to internet based content, citizens showed concern for the impacts of westernization and foreign culture on the upbringing of their children.

The religious values and cultural traditions prohibit people from indulging in behaviors that are considered ‘sexually inappropriate’. Access to pornographic material has traditionally been limited. However, with access to the internet and multimedia messaging service on mobile phones, it is far easier to access such material discretely. A participant who runs an internet café shared his observations of young boys and girls:

*I mind my own business but at the end of the day, the server generates reports of most visited websites and pages. Pornographic content is at the top and free email services such as Hotmail, Yahoo and Gmail are grouped closely in the second place... Access to pornographic material has never been this easy. I see this as a major cultural shift which is troubling. The internet has a lot of benefits for everyone but we need to distinguish between good, bad and ugly.*

The lack of privacy and nuisance due to cell phones, TV, internet and computers was also considered against the cultural values that emphasize politeness and respect for others. Phrases such as “*I cannot go to a park or anywhere else and have a quiet time; phones keep ringing everywhere*”, “*only time I relax is when I shutdown my computer and cell phone*”, and “*I cannot concentrate on anything because I am always getting emails and SMS – even in the middle of the night; I don't want to be left out of the loop either*” provide strong evidence that ICT growth is beginning to affect cultural values.

Family values are considered important in Pakistan. From giving up ones' own comforts for the future of children to taking care of the elderly are cherished values. However, ICT growth

has created situations for some participants where they have to choose between economic opportunity and taking care of families. For example, a participant in a rural area earned the reputation of an excellent project manager at her workplace. Due to the problems in IT administration, she was chosen to take greater responsibility:

*My boss did not give me a choice and wanted me to head the IT department. I told him that I didn't know a thing about computers but he said I could learn these things. I got a big raise too... I enjoy this job because I have learned a lot here but it has turned my family life upside-down and I cannot take care of my family and children as much as I used to do before... I feel bad that I cannot fulfill my responsibilities of taking care of my children in the same way that my mother did for my siblings and myself.*

She carries her phone even when she is cooking food just in case she is needed during network and IT services disruptions.

In addition to positive aspects of ICT growth, the narratives frequently described ways ICT went against indigenous values. For example, ICT was cited as a reason for unnecessary expense, wasting time, and lack of attention in contrast to a culture of savings for the rainy day, valuing time, and showing politeness.

### **Personal Security and Criminal Use (*I feel secure*)**

Personal security is derived from categories of codes that represent sense of security, peace of mind, and in some cases fear of being robbed, harassment, sexual misconduct, stealing, online fraud, and ICT use for criminal activities. These constituted 193 codes or 16% of the total. The notion of the role of ICT for personal security came from narratives showing the ability to stay connected at all times with the use of a cell phone. The notion of criminal use emerged from stories of stealing money to pay for phone bill, fear of online scams, and preying upon unsuspecting victims.

In the developed world, once police is notified, there is an expectation of security, safety and protection for the person reporting the problem. This assumption might not hold true in several developing countries where police departments and law enforcement agencies have the reputation of being corrupt institutions. Traditionally, the role of police and law enforcement in

society is portrayed negatively. Some of this is rooted in the colonial system where police was used as a tool to only protect the interests of government. Therefore, dependence on friends and family in the event of a problem or emergency is more common. In this regard, ICT provide a way of staying in touch with family and friends who can be trusted in emergencies.

From a personal safety perspective, women are considered vulnerable especially when alone. It is normal to see women accompanied by a family member as a safety mechanism. Sometimes, even a small child accompanying a woman can counter the safety issue. Cellular phones can be carried around easily and used discretely. A woman expressed these feelings:

*I have never stepped out of my house alone. I will always have someone with me... maybe even a toddler. A companion is an assurance that someone is with me to take care of me if I find myself in an odd situation. Since I got this cell phone, I know I can call my family members anytime. Now, I feel OK to go out alone for shopping and to visit family members nearby. It is like someone is with me all the time. It's great to have a phone particularly in an emergency. If something were to happen to me, my family will immediately know that I need help.*

In a previous section, the narrative of a student was also evidence that even in 'liberal' and 'open-minded' families, cell phones are considered an important safety mechanism. However, a participant highlighted another aspect of personal security. This aspect involved being victim of the breach of personal security. He said:

*I was once robbed; this dude wanted to snatch my cell phone... I know a few other people who were robbed for their phones. Even though regular cell phones are cheap, they can be sold for quick cash.*

Similar parts of narratives were coded as "fear of being robbed" but the frequency of this category of codes was relatively low. Moreover, Pakistan Telecommunication Authority has activated a system where stolen and robbed phones can be permanently disabled when reported.

There are some criminal behaviors which might be considered universally inappropriate and unacceptable. Consider the narrative of a young barber who works at his father's shop. His daily pocket allowance is Rs. 20, but his daily cell phone expense is Rs. 500. He calls prostitutes

and spends hours in discussions that may be described as erotic. For his addiction, he steals money from the cash drawer.

*I know it is wrong to steal money to pay for my cell phone bill but I cannot help it... my father sometimes suspects that I am stealing money from the drawer but I don't leave a clue. I am quite expert at it now... I feel sad when I steal money but then my desires to speak with woman takes me over and I cannot control myself... I just can't overcome my addiction of speaking with women who I don't really know... my father wants me to get married but I have a lot of aspirations. I want to be famous and rich and have a good life... The cell phone makes me live a life of fantasy and I feel that I am important because some women need me. I know it is not good but I cannot help it and don't know how to stop it.*

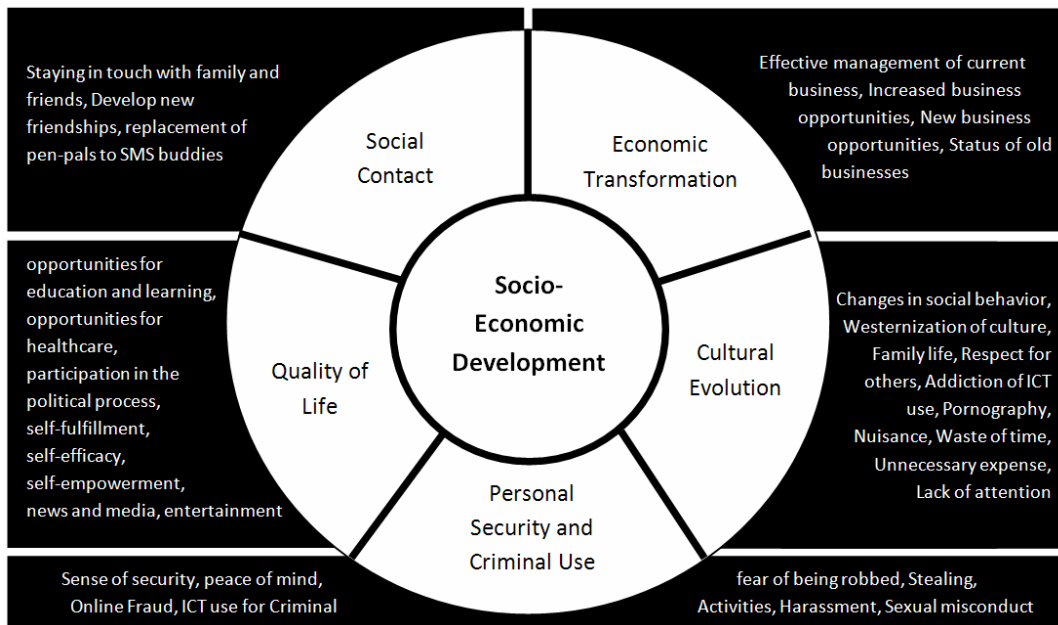
ICT have the ability to create a world of fantasy where people can forget about the realities of life or think about morality and legality of ICT use. There were more stories of online fraud and the use of ICT for criminal activities. An educated old woman described:

*My bank has provided me an online ID and password for my account... I have internet access and I use email to communicate with my siblings in other cities and countries... but I never log into my account online. I still do my financial transaction the old fashioned way with a 'passbook' [a small diary that is used to record banking transaction for customer's own record] and checks. I have read about people whose accounts were wiped clean by criminal people... I just don't want to take chances.*

The "Cyber Law Ordinance" that took effect in December 2007 was the result of using emails to lure Daniel Pearl of Wall Street Journal into a trap. Later, a video of his beheading were posted online. The criminals were apprehended after their IP address was traced. However, it was too late for Mr. Pearl. Currently, National Response Center for Cyber Crimes (NR3C) at the Federal Investigation Authority (FIA) is responsible for tracking, apprehending and prosecuting crimes including financial crimes that involve the use of ICT.

## **A THEORETICAL MODEL OF ICT BASED SOCIO-ECONOMIC DEVELOPMENT**

A diagrammatic representation of the dimensions and themes identified by scaling up of the codes is shown in figure 3. This hierarchical model represents socio-economic development as the central theme and depicts the dimensions as well as various categories of codes.



**Figure 3. An Axial Model of the Dimensions of Socio-Economic Development**

It is instructive to examine the model in comparison with the widely used theoretical model by Madon (2000). The comparison provides validation of the narrative research method as well as points to its many strengths, realism and empirical grounding.

***Economic Growth vs. Economic Transformation:*** Madon’s notion of economic growth is derived from application of the internet for economic productivity. However, the terms: economic growth and economic productivity are not always positive influences. The positive impacts of ICT were found true in the narratives of present research; however, citizens also recognized negative impact of ICT which were missing in Madon's conceptualization. Economic productivity does not sufficiently address the demise of old business models and regimes with the introduction of ICT. Our research extends Madons’ notions of economic growth and productivity with the use of a more encompassing term: economic transformation. Economic transformation addresses the impact of ICT on business whether it is positive or negative. Additionally, it addresses poverty alleviation (which Madon identified as part of social wellbeing by highlighting increased entrepreneurial opportunities for poor citizens.

***Social Wellbeing and Political Wellbeing vs. Quality of Life:*** Madon derives the social wellbeing dimension from internet applications in education, health, poverty alleviation and empowerment. The political wellbeing dimension is derived from application of internet for democracy. Our “quality of life” dimensions is more encompassing. Awareness covers all areas that Madon identified as part of social and political wellbeing. The qualitative evidence from the narratives demonstrates that ICT has applications in education, healthcare, political speech (democracy) and entertainment. It is therefore logical to combine social and political dimensions into one more comprehensive and encompassing dimension.

***Physical environment:*** Madon derived physical environment as a dimension from her conception of sustainable development. Our research did not find evidence for sustainable development as a concern in citizens’ narratives. In Pakistan, ICT growth has been rather fast (teledensity grew from 2.8% in 2000 to 62.9% in November 2009). The fast pace development has resulted in continuous introduction of new ICT products and services. Insights from officials who make or influence government policies demonstrate that ICT growth so far has not yet been saturated. There is recognition among government officials and citizens alike that more growth is evident. This means that without particular attention to sustainable development, ICT growth will continue to occur in the foreseeable future.

***Personal Security and Criminal Use, Cultural Evolution:*** Madon does not recognize personal security and criminal use of ICT as a dimension of socio-economic development. Similarly cultural evolution is not recognized by Madon. The theoretical groundedness in citizens’ narratives provides this research advantage of understanding and building on how citizens interpret ICT based socio-economic development. Personal security might be taken for granted in the Western world whereas in developing countries ‘fear of being robbed’ and not have police help presents a real threat to the citizens. ICT based cultural evolution has been a recent and emerging phenomenon in developing countries. It is therefore a contribution of this research to



identify two dimensions that are real to people in developing countries and have not been discussed in past literature.

## **INNOVATIONS IN QUALITATIVE RESEARCH**

During the course of this research, several novel applications of qualitative methods were made. Many of these are innovative and provide methodological guidance and foundations for future research.

### **Using the Narrative Method**

The application of narrative method as a data collection and analysis tool has provided great insights in understanding ICT based socio-economic development from the citizens' perspectives. It also provides methodological foundation and guidance for future qualitative research. Nonetheless, there were a number of unknowns that are inherent in conducting research in developing countries. Some even warned that citizens, especially those who do not have any formal education, may not know how to present their stories. We experienced that educated participants in general were brief and needed frequent prompting in continuing their stories. On the other hand, participants with no formal education were very detailed and exhibited a great deal of philosophical depth in their experiences. They made the research very exciting and rich. Thus an educational degree is not a prerequisite for storytelling.

Anecdotal evidence might suggest that people may not speak up in the presence of recording devices such as intrusive video camera and a collar microphone. We observed that most participants very excited by the fact that they were being recorded. In only one instance use of the video camera was not possible. In that instance camera was not allowed inside a government building in Islamabad for security reasons. However, we always informed research participants and asked for their permission for the use of camera before actually taking it out of the bag.

## **Effective Use of Qualitative Analysis Software - No More Transcripts or Translations**

Qualitative researchers are expected to deal with a lot of transcription and in some cases translations. Transcripts provide a sequential record of interviews and it is easy to go back and forth during analysis. It is also easy to write reflections, identify codes and highlight important quotes. However, a lot of rich contextual information such as body language, inflection of sounds and emphases on particular words is lost. Preservation of environmental factors is difficult. These factors may have to do with the place where interview is taking place and research participants' reactions to things in the background, e.g., interview in a wheat harvesting field when people are working under hot sun, or picking cotton on a freezing cold morning under dense fog.

A video or audio file provides a sequential record of the interview and is effective in preserving body language, and participant's actions and reactions to the environment. It is also easy to go back and forth in the video. However, it is not easy to go to a specific marker in the interview or write reflections on the video file. We used the qualitative analysis software NVivo 8. This tool has the capability to allow recording of reflections, codes and categories on the video file itself using a feature called time stamping. This allows searching for a specific code and related video clips. It can count how many times a code were highlighted without losing contextual information. Once transcription was no longer needed, we had more time to spend on analysis. Since the first author has mastery over all four languages in which interviews were conducted, only selective translations were made for the important quotes in the research report.

### **Use of Video/Audio Equipment**

We used professional video/audio equipment. Learning how to correctly and effectively use this equipment was challenging. The first author spent Spring and Fall of 2007 in broadcasting department of his university to learn how to professionally use this equipment.

During the course of this training, it was discovered that rules for informed consent are different for research involving video recording. A research participant's willingness to be videotaped constitutes implied consent which is an acceptable form of informed consent. We ensured to explain the purpose of research and videotaping before conducting the interviews. This was particularly helpful because a number of research participants did not know how to write their names and could not sign off a consent form.

### **A Video Documentary**

We also made a short video documentary which was used in research presentations. This documentary is a powerful medium in exhibiting the situations where citizens are putting ICT to work for their socio-economic development. The documentary is also evidence of intensive research.

### **Other Observations**

Qualitative research in general and narrative research in particular can be very detailed and sometimes even intrusive. It is important to understand the cultural sensitivities and traditions when conducting research. This is even more important when interviewing women in Pakistani culture where it is a taboo for a man to speak with a woman without the presence of another person. Further, in addition to getting permission from the female participant, it is important to seek permission from the head of family, usually the husband or the father.

We experienced a very supportive environment for using recording devices and asking for life stories. However, things did go wrong. Unscheduled electric power failure was a routine and dealing with traffic in large cities during weather extremes could be challenging. We had to overlook issues of sanitation and hygiene when the participants offered us something to eat. It is customary and polite to accept such gifts. Researchers conducting research in developing countries should expect things rooted in the local traditions.

Some situations might not be very friendly and appropriate caution need to be exercised. Latif (2009) reported being threatened with "we will break your camera" for recording women working in the field. Similarly, in most government buildings, recording devices are prohibited.

## **CONCLUSIONS**

This study explored the concept of ICT-driven socio-economic development, as perceived by ordinary citizens of a developing country. While authors and pundits have described their own views of socio-economic development, the “people’s” view is of paramount importance and cannot be ignored, given that it most directly affects their lives. An empirically grounded hierarchical model of ICT based socio-economic development is formulated, which integrates five dimensions. Another major contribution of this research is the application of the narrative research method in the context of IS research. As demonstrated by the exemplar study, this method has much to offer to the IS researchers and should be in important part of their toolbox. The research also employed several other innovations in qualitative research. The application of these qualitative methods contributes to an enhanced understanding of socio-economic development in countries with similar economic, cultural, and religious background as Pakistan. The model has implications for policy and program design, which in turn have important consequences for governments, businesses, and citizens.

## **REFERENCES**

1. Abbott L. (2002) Theories of Industrial Modernization and Enterprise Development: A Review. Industrial Systems Research Publications, Manchester.
2. Ahmed, S., Adams, A., Chowdhury, M. and Bhuiya, A. (2000) Gender, socioeconomic development and health-seeking behavior in Bangladesh. *Social Science and Medicine* 51(3), 361-371.
3. Alvarez, R. and Urla, J. (2002) Tell me a good story: Using narrative analysis to examine information requirements interviews during the ERP implementation. *The Database for Advances in Information Systems* 33(1), 38-52.
4. Amin, S. (1976) *Unequal development: An essay on the social formations of peripheral capitalism*. Monthly Review Press, New York.
5. Bartis, E. and Mitev, N. (2008) A multiple narrative approach to information systems failure: a successful system that failed. *European Journal of Information Systems* 17(2). 112-123.

6. Blakely, E.J. (2000) *Community Development Research: Concepts, Issues, and Strategies*. Human Sciences Press, New York.
7. Casey, K. (1993) *I answer with my life: life histories of women teachers working for social change*. New York: Routledge, 1993.
8. Casey, K. (1996) *The New Narrative Research in Education*. *Review of Research in Education* 21(1995:1996). 211-253.
9. Central Board of Revenue, Accessed on January 12, 2008 from [www.cbr.gov.pk](http://www.cbr.gov.pk)
10. Chae, B. and Poole, M.S. (2005) *The surface of emergence in systems development: agency, institutions, and large-scale information systems*", *European Journal of Information Systems* 14(1). 19-38.
11. Choudhury, A., Zaman, S. and Harahap, S. (2007) *An Evolutionary Topological Theory of Participatory Socioeconomic Development*", *World Futures: Journal of General Evolution* 63(8). 584–598.
12. Cresswell, J.W. (1998) *Qualitative inquiry and research design: Choosing among five traditions*. SAGE Publishers, Thousand Oaks.
13. Cresswell, J.W. (2006) *Qualitative Inquiry and Research Design*. Second edition. Sage, Thousand Oaks.
14. Danzger, J. (1977) *Computers and the Frustrated Chief Executive*. *MIS Quarterly* 1(2). 43-52.
15. Davidson, E. (1997) *Changing frames or framing change? Social cognitive implications of organizational change during IT adoption* In *Proceedings of the 1997 HICSS*. 475-484.
16. Dube, L. and Robey, D. (1999) *Software stories: three cultural perspectives on the organizational practices of software development*. *Accounting, Management and Information Technologies* 9(1999). 223-259.
17. Gallup, J. (2000) *Geography and Socioeconomic Development*, Background paper examining the state of the Andean region for the Andean Competitiveness Project. Retrieved from [http://www.cid.harvard.edu/archive/andes/documents/bgpapers/geography\\_socioeconomicdevelopment.pdf](http://www.cid.harvard.edu/archive/andes/documents/bgpapers/geography_socioeconomicdevelopment.pdf) on January 10, 2010.
18. Goldsworthy, D. (1988) *Thinking Politically about Development*. *Development and Change* 19(3). 505-536.
19. Hardy, A. (1980) *The role of the telephone in economic development*, *Telecommunications Policy* 4(1). 278–286.
20. Hirschheim, R. and Newman, M. (1991) *Symbolism and information systems development: myth, metaphor and magic*. *Information Systems Research* 2(1). 29-62.
21. Houtman, D. (2004) *Class and politics in contemporary social science: 'Marxism Lite' and its blind spot for culture*. Aldine Transaction, New Jersey.
22. Hsieh, J.J., Rai, A. and Keil, M. (2008) *Understanding Digital Inequality: Comparing Continued Use Behavioral Models of the Socio-Economically Advantaged and Disadvantaged*. *MIS Quarterly* 32(1). 97-126.
23. Jacobs, G., Macfarlane, R. and Asokan, N. (1999) *Towards a Comprehensive Theory of Social Development*. *Human Choice: World Academy of Art & Science*, retrieved from [http://www.icpd.org/development\\_theory/comprehensive\\_theory\\_of\\_social\\_development.htm](http://www.icpd.org/development_theory/comprehensive_theory_of_social_development.htm) on January 21, 2010
24. Joseph, D., Kok-Yee, N., Koh, C. and Soon, A. (2007) *Information Technology Professionals: A Narrative Review, Meta-Analytic Structural Equation Modeling, and Model Development*. *MIS Quarterly* 31(3). 547-577.
25. Kaivo-Oja, J. and Rikkonen, P. (2005) *Key issues for successful scenario planning: perspectives on sustainable use of natural resources in agricultural sector, in Sustainable use of renewable natural resources — from principles to practices* (JALKANEN A and

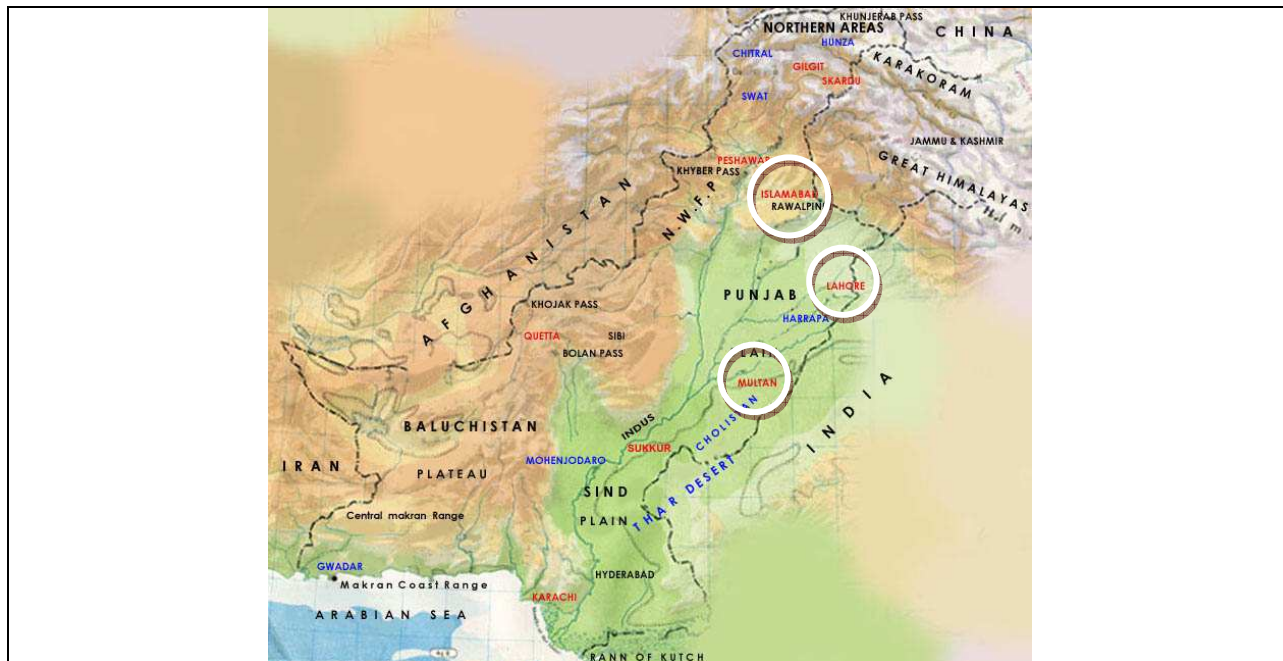
- NYGREN P EDS), University of Helsinki, Department of Forest, Ecology Publications 34.
26. Kozma, R. (2005) National policies that connect ICT-based education reform to economic and social development. *Human Technology* 1(2). 117-156.
  27. Kuechler, W.L. and Vaishnavi, V. (2006) So, Talk To Me: The Effect of Explicit Goals on The Comprehension of Business Process Narratives. *MIS Quarterly* 30(4). 961-A16.
  28. Latif, A. (2009) Social Context of Literacy: Lesson Learned from Girls' Narratives in Pakistan. In *Proceedings of the American Educational Research Association Meeting*. San Diego, CA.
  29. Levina, N. and Vaast, E. (2008) Innovating Or Doing As Told? Status Differences and Overlapping Boundaries In Offshore Collaboration. *MIS Quarterly* 32(2). 307-332.
  30. Lewis, A. (1954) Economic Development with Unlimited Supplies of Labour. *The Manchester School* 22(2). 139-191.
  31. Madon, S. (2000) The Internet and socioeconomic development: exploring the interaction. *Information technology and people* 13(2). 85-101.
  32. Orlikowski, W. and Iacono, 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.
  33. Oxford English Dictionary (2010) Retrieved from <http://www.oed.com/> on January 19, 2010.
  34. Peshkin, A. (1988) In search of subjectivity – One's own. *Educational Researcher* 17(7). 17-21.
  35. Potter, R.B., Binns, T., Elliott, J.A. and Smith, D. (2004) *Geographies of Development*, Prentice Hall, New York.
  36. Preston, P. (1996) *Development Theory: An Introduction to the Analysis of Complex Change*. Wiley-Blackwell, Oxford.
  37. Puri, S. (2007) Integrating Scientific with Indigenous Knowledge: Constructing Knowledge Alliances for Land Management in India. *MIS Quarterly* 31(2). 355-379.
  38. Ramos, A. (2006) Social values dynamics and socio-economic development, *Portuguese Journal of Social Science* 5(1). 35-64.
  39. Riessman, C.K. (1993) *Narrative analysis*. SAGE Publications, New York.
  40. Rostow, W.W. (1990) *The stages of economic growth: A non-Communist manifesto*. Cambridge University Press, Cambridge.
  41. Roy, M.C. and Lerch, F.J. (1996) Overcoming ineffective mental representations in base-rate problems. *Information Systems Research* 7(2). 233-247.
  42. Szirmai, A. (2005) *The dynamics of socio-economic development: An introduction*. Cambridge University Press, Cambridge.
  43. Urquhart, C., Lehmann, H. and Myers, M. (2009) Putting the 'theory' back into grounded theory: guidelines for grounded theory studies in information systems. *Information Systems Journal*, DOI 10.1111/j.1365-2575.2009.00328.x.
  44. Wallerstein, I. (2001) *World-systems analysis: An introduction*, Duke University Press, Chapel Hill.
  45. Walsham, G. (2001) *Making a World of Difference: IT in a Global Context*. Wiley & Sons, New York.
  46. World Bank (2010) Glossary. Retrieved on January 10, 2010 from <http://www.worldbank.org/depweb/english/beyond/global/glossary.html>

## Appendix A. About Pakistan and Research Sites

### About Pakistan

There are several reasons for selecting Pakistan for this research. First, while a developing country, Pakistan is the seventh largest populated country and has the highest one year growth rate of ICT industry (147%) in the world, followed by Bangladesh (135%), and India (97%) (Willing, 2007). Second, a large portion of the population in Pakistan lacks access to basic ICT needs such as reliable electric power, and infrastructure. Third, the cost of traditional ICT infrastructure, devices and services is significantly high and, therefore, the government has pushed deregulation policy with enabling legislation to facilitate wireless ICT access (to avoid laying costly cables based infrastructure). This situation has allowed for cheap and reliable ICT devices, such as third generation mobile phone systems, CDMA 2000, and WiMax devices that enable poor people and those in remote areas to get connected (Mujahid 2002; Gao and Rafiq, 2009). Fourth, a large segment of Pakistani society suffers from the lack of basic resources, illiteracy, and low income. Even if ICT access was possible to this segment, it would still be difficult to sustain meaningful impact of ICT in their lives. Finally, Pakistan is experiencing an evolving regulatory framework with changes in government policies for the growth of ICT sector since the early 1990s (Baqir and Pervez, 2000; Mujahid, 2002; Gao and Rafiq, 2009).

### Research Sites



Research Sites includes urban and rural areas in and around Islamabad, Lahore and Multan regions. These cities are surrounded by several rural and underdeveloped towns and villages that lack access to basic ICT infrastructure and services. The ICT infrastructure disparities within close proximities are typical of ICT infrastructure in Pakistan.

## Appendix B. Summary of Backgrounds and Narratives of Some Participants

Participant #	Selection Criteria	Narratives Summary
1	<b>Gender:</b> Woman <b>Domicile:</b> Rural <b>Education:</b> Illiterate <b>Income:</b> Medium ~50 years old entrepreneur	<p>This participant has a small cloth sale business in several nearby towns close to her village. She travels as far away as 300 miles to buy cloth at whole sale prices and sells at profit to villagers who cannot travel. Her business has grown significantly since she got a cell phone. Her customers call her and tell what they want when she is traveling. Her personalized service for customers has increased her revenues. She said: <i>“I continuously travel from one village to another and for buying wholesale cloth. My customers love the fact that they can place ‘special orders’”</i>.</p>
2	<b>Gender:</b> Man <b>Domicile:</b> Urban <b>Education:</b> High School <b>Income:</b> High ~35 years old entrepreneur	<p>This participant owns a small mechanical parts manufacturing facility in a small urban area. The demand for his quality parts has grown steadily between 2003 and 2007. In late 2007, he imported a used machine to automate the manufacturing process. However, the machine had missing parts and was not in operational condition. He used internet to find a manual for this machine, made and fixed some parts and brought the machine in operational condition. The variation in production process has gone down (0.0001% rejection rate) and demand has increased significantly (800% in one year). He uses internet, email and cell phone to stay in touch with his clients in different countries. He said: <i>“I have no idea what I will do without internet”</i>. He said: <i>“my business has expanded several folds since I started using a phone and email to keep in touch with my suppliers”</i>.</p>
3	<b>Gender:</b> Woman <b>Domicile:</b> Urban <b>Education:</b> Graduate <b>Income:</b> High ~50 years old school teacher	<p>Her children permanently live in the United States. She said: <i>“I don’t cry anymore; I can speak with my children as much as I want without worrying about the bill”</i>. Calls to United States and most other countries do not cost more than local call toll. She said she used to wait every weekend for her children to call her. Now she can call whenever she wants. <i>“I sometimes see my children on a webcam as well”</i> she said. This is one of the most important changes that ICT have brought in her life.</p>
4	<b>Gender:</b> Man <b>Domicile:</b> Rural <b>Education:</b> Illiterate <b>Income:</b> Low ~40 years old honey farmer	<p>He travels to find places with flowers for his bees. In addition to keeping in touch with his family, he relies on his cell phone to find markets where he can get best rates for his honey. He said: <i>“I do not have to run around anymore to find a better rate”</i>. Sometimes bees develop a deadly fungus. He can immediately call someone to bring treatment for his bees from a far off city. He said: <i>“It is very expensive and difficult to raise bees once again if they die due to fungus. I don’t suffer those losses anymore because I can get medication right away”</i>.</p>
5	<b>Gender:</b> Man <b>Domicile:</b> Urban <b>Education:</b> Illiterate <b>Income:</b> High ~38 years old entrepreneur	<p>This “illiterate mechanical engineer” was making a pulley system for a machine that could be used in construction or agriculture businesses to fetch loads or water. He said: <i>“I got the idea from a TV program. I already have a customer who will be using it in his construction business”</i>. Additionally, he runs public transport system with 5 passenger vans. <i>“I can keep in touch with my employees and know exactly where they are when the van breaks down and I have to go and fix it”</i> he said.</p>
6	<b>Gender:</b> Woman <b>Domicile:</b> Urban <b>Education:</b> Graduate <b>Income:</b> Low ~24 years old university student	<p><i>“Initially, My parents did not allow me to go to Islamabad to study at one of the premier universities in Pakistan”</i> this participant said. Her parents were concerned of her safety in a city as far away as 500 miles. However, things changed when they got her a cell phone and found out that they could always stay in touch with her. She said: <i>“I probably would not be pursuing higher education if I didn’t have a cell phone and my parents didn’t feel that they can keep in touch with me anytime they wanted”</i>. She has access to a large online library which helps her in research and access to latest publication on her areas of interest. She explained: <i>“I use online library to find research papers to support my</i></p>



		<i>literature review and research”.</i>
7	<b>Gender:</b> Man <b>Domicile:</b> Rural <b>Education:</b> Illiterate <b>Income:</b> Medium ~23 years old barber	This participant works in his father’s barber shop. He spends hours on phone with prostitutes. His daily pocket money is Rs 20 but his daily cell phone expense is Rs. 500. To satisfy his addiction, he steals money from the barber shop cash drawer. <i>“I know it is wrong to steal money to pay for my cell phone bill but I cannot help it”</i> he said. <i>“My father wants me to get married but I have a lot of aspirations. I want to be famous and rich and have a good life”</i> he added. He explained: <i>“The cell phone makes me live a life of fantasy and I feel that I am important because some women need me. I know it is not considered good but I cannot help it and don’t know how to stop it”.</i>
8	<b>Gender:</b> Woman <b>Domicile:</b> Rural <b>Education:</b> Illiterate <b>Income:</b> Medium ~50 years old housewife	<i>“I have seen a lot of girls and boys making out on phone and even deciding on marrying without their parents’ approval; this is very bad”</i> this participant said. This conservative woman in a village admits that cell phones are very helpful in several aspects but doesn’t want young girls and boys to be carrying phones around just to waste time on <i>“useless”</i> talk. She sees a major transformation in the social structure in rural areas where parents are losing control over their children in young age due to cell phones.
9	<b>Gender:</b> Woman <b>Domicile:</b> Urban <b>Education:</b> Graduate <b>Income:</b> High ~45 years old IT administrator	This participant accidentally got involved in IT administration because of good credentials in project management. <i>“My boss did not give me a choice and wanted me to head the IT department. I told him that I didn’t know a thing about computers and he said, you can learn these things. I got a big raise too”.</i> She explained: <i>“I enjoy this job because I have learned a lot here but it has turned my family life upside-down”.</i> She carries her phone with her when she is cooking food for her children just in case her services are needed during network and IT services disruptions.
10	<b>Gender:</b> Man <b>Domicile:</b> Urban <b>Education:</b> Illiterate <b>Income:</b> Medium ~34 years old donkey cart owner	This participant hauls loads from warehouses to furniture showrooms when someone makes a purchase in a showroom. <i>“The owner of the showroom would go peak out of his place to see if a donkey cart person was there”</i> he said. Then he got a cell phone. He cannot read... not even numbers (he visually matches patterns for a phone number on a piece of paper and dial pad of his phone when he needs to dial a number). He explained: <i>“Someone helped me with setting up the phone for distinctive ring tones. Showroom owners give me a missed call, and I can recognize who needs my help by a specific ring tone setup for a particular showroom owner. Now, I can work as much as I want”.</i>
11	<b>Gender:</b> Man <b>Domicile:</b> Urban <b>Education:</b> High School <b>Income:</b> High ~27 years old plumber	<i>“I started my plumbing business a few years ago. I rented a place to setup my shop. I did a mediocre business”</i> he said. He bought a cell phone in 2007. Now, he only puts his cell number on the business card. He explained: <i>“I do more business and my customers never have to leave their place to come see me. They just call me and I am there for service and repair in a few minutes”.</i> His business has expanded significantly and costs have gone down. He explained: <i>“my costs of doing a business have gone down because I don’t need to rent a shop anymore”.</i>
12	<b>Gender:</b> Man <b>Domicile:</b> Urban <b>Education:</b> Graduate <b>Income:</b> High ~39 years old vice-president of a software development house	This participant travels frequently to see his clients overseas in Europe and United States. <i>“ICT have changed my life; my life revolves around these technologies”</i> he said. He uses online meetings with his clients but for major decisions such as signing off a large project or deliver final product in a ceremonial manner, he travels for weeks away from his little children, wife and old parents. <i>“When I am on a business trip abroad, I can still see my 5 and 2 years old girls on webcam and they can see me too; my mother does not feel that I am away because she can still see me and speak with me every night before she goes to bed. ICT keep us united even when we are physically apart”</i> he added.