Mobile technologies & socio-economic opportunities for disadvantaged women: a study of information behavior in a developing nation context

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Mobile Technologies & Socio-Economic Opportunities for Disadvantaged Women: A Study of Information Behavior in a Developing Nation Context

by

Devendra Dilip Potnis

A Dissertation Submitted to the University at Albany, State University of New York In Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy

College of Computing & Information Department of Informatics

2010
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ABSTRACT

Information and communication technologies (ICTs) have been championed by the United Nations and others as one of the key media to open up socio-economic opportunities for disadvantaged populations. Studies lead us to believe that after being introduced to ICTs, users’ information behavior changes, enabling them to benefit from socio-economic opportunities. Using Wilson’s (1997) Revised General Model of Information Behavior (Model), the dissertation explored the role of cell phones – the fastest spreading information and communication technology (ICT) – in shaping the information behavior of disadvantaged population, with its implications on socio-economic opportunities.

To identify one of the most disadvantaged cell phone owner and user groups, the research applied stratified purposive sampling with 6 filters: (i) citizens of India, the country with the highest number of citizens living under the poverty-line defined by the Government, (ii) resident in rural context with less socio-economic opportunities compared to urban context, (iii) “backward class”, (the term was coined and defined by the Government of India) disadvantaged population from socio-economic and education perspective, (iv) female in male-dominated society, (v) individuals with daily income less than a dollar (the poverty-line defined by the World Bank), and (vi) cell phone owners and users.

As a result of the group-administered surveys completed by 100 respondents in the first phase, unmarried girls (UMG) and women married for more than 20 years (MW) emerged as two groups with distinct information behavior. In the second phase, 12 UMG and 10 MW were interviewed on the phone in Marathi, their native language. Software-aided analysis refined the Model’s construct from context of information needs to context of communication and information needs, which also acts as the main controller of information behavior for
respondents. The research proved that change in information behavior is an indispensable, intermediate stage between access to cell phones, and the use of cell phones for exploring socio-economic opportunities.

The research serves as a reference for crafting policy and designing dollar-aide strategies for sustainable development, using mobile technologies. The private sector could apply research findings for better human-centered designs and interfaces of mobile technologies, and improve marketing to boost the sale in developing nations.
ACKNOWLEDGEMENTS

With the Almighty’s blessings, this dissertation is dream come true for all of us. The driving force for my work is the core value of “owing to the society”, which was inculcated by my Aaee (Mother) with her life-long social work for needy and oppressed women, and her advocacy for women empowerment. On Indian front, my Aaee’s ambitions, Pappa’s dreams, and my brother’s consistent support and sacrifices laid the foundation for my higher studies. Here on American front, Kanchan’s beautiful friendship and unconditional support created a great synergy in my personal and professional life. Shobha Mavshi, Madhu Kaka, Aaji, and Nana were my loving family in New York. A Course in Miracles’ spiritual philosophy facilitated by Ray created peace and love in a stormy phase of my personal life. I truly appreciate Sriram, Pappu dada, Swapna, and Pinky for their genuine concern and affection during this period.

While completing my Masters in Public Administration, Dr. David Andersen and Dr. Sharon Dawes mentored my academic journey, developing and shaping my passion for electronic-Governance. The dissertation research idea was incepted in Dr. Hemalata Iyer’s research pro-seminar on Information Organization, and with Dr. Theresa Pardo’s strong belief in my potential and firm support for further journey, this research took off. Her academic and consultation expertise influenced the process of framing research problems.

Brainstorming sessions with number of researchers on campus, including Dr. Terry Maxwell, Dr Jagdish Gangolly, Dr. Sharon Dawes, Dr. Annis Golden, Dr. Jennifer Stromer-Galley, Dr. David Andersen, Dr. George Richardson, and Dr. Richard Lachmann challenged my critical thinking, bringing clarity and focus in my research design. Dr. Senem Guney’s
valuable guidance changed my approach towards literature review. Her firm support and championship for articulated research writing brought a phenomenal improvement in my writing style. Dr. Deborah Andersen’s empathetic nature, encouragement, and diligence in improving my English writing raised me to significantly higher level of academic writing. I am grateful to Dr. Hemalata whose guidance shaped survey questionnaire and some of the future research questions. My research association with Dr. Lakshmi Mohan trained me for detail-oriented, rigorous, and quality research. Her ethics and professional commitment will have a long-lasting impact on my career.

Once again, I thank to my Aace and Pappa, who managed logistics of the surveys in India. It was impossible for me to even think about completing this research without Mrs. Jyoti Rayrikar and Mr. Heramb Rayrikar’s extraordinary assistance in rural India. I must thank Prajakta for timely scanning almost 600 pages of 100 survey responses, especially when the available scanner was accepting only one page at a time.

I am indebted to my doctoral cohort, especially Dr. Fawzi Mulki for graciously lending his voice recorder, and Dawit, Mohammed, Alexis, Tino, Matt and Steve with whom I could bounce back research ideas at times. I would like to thank Dr. Shobha Chengalur-Smith for trusting my teaching abilities and offering me teaching opportunities at the School of Business, which brought financial security for three consecutive summers. Once again, I would like to thank Dr. Theresa Pardo, my Dissertation Chair, whose periodic guidance on number of conceptual and organizational issues made me focus on the process of conducting research, enhancing the quality of research. I was truly fortunate to have a great Dissertation Committee.
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Chapter 1

Introduction

Since the declaration and adoption of Millennium Development Goals (MDG) by the United Nations (UN), the role of information and communication technologies (ICTs) has been explicitly recognized and increasingly applied by public and private sector organizations, thereby serving their stakeholders better (Batchelor et al. 2003, United Nations 2001). The UN has played a key role of championing investment and deployment of ICTs all over the world for the betterment of the society (United Nations 2003). From various ICT-led initiatives, the degree of deployment of ICTs is found directly proportional to the level of socio-economic development experienced by citizens (United Nations 2003). Citizens’ exposure to ICTs eventually leads to a knowledge-based economy (UN 2004). It is important to note that access to information is essential for the emergence of the knowledge-based economy as well as the global information society (Bhavnani et al. 2008). Studies also reveal that access to information achieved through the deployment of ICTs offers socio-economic empowerment to disadvantaged populations, enhances their skills, and links various institutions involved in financial inclusion and poverty reduction (Bhavnani et al. 2008).

Figure 1: Linkage between ICTs and Socio-economic Opportunities
Source: Informed by the UN 2004
This dissertation research is situated in the context of a developing nation, where the direct linkage between ICTs and socio-economic opportunities (See Figure 1) has been confirmed over and over again (United Nations 2004, 2005, 2008). The introductory chapter outlines the background for this dissertation research along with a set of research problems identified for the research. The second chapter offers a brief overview of an interdisciplinary theoretical background for exploring the linkage between ICTs and the information behavior. With the help of the Model as a navigating tool, the chapter explores the field of information behavior; and presents a reinforced interdisciplinary evolution in the field. The third chapter entails a detailed research design for the dissertation. It also lists strengths and limitations of data collection and analysis methods. The fourth chapter delineates data and results from the analysis of quantitative data collected through group-administered surveys. UMG and MW emerged as two groups with distinct information behavior. The fifth chapter illustrates how the “context of communication and information needs” emerges as the key construct, influencing information behavior of both the groups (UMG and MW). In the sixth chapter, the researcher makes sense out of qualitative data collected in the second phase of the dissertation research, discussing various impacts of cell phones on the disadvantaged women who own and use a cell phone, earning less than a dollar per day in a rural part of India. The chapter also presents theoretical contributions made by this research and lists a myriad of applications of the dissertation research in the public sector, private sector and academia. The seventh chapter reflects various hurdles that were faced during the interview process, underlining the cultural and contextual features. The eighth chapter outlines possible directions of future research.
1.1 Dissertation Research Problem

The UN e-Readiness Reports indicate the strong linkage between ICTs and socio-economic opportunities (United Nations 2004, 2005, 2008). However, for a long time, analysts and decision makers have been observing a complex relationship between ICTs and socio-economic status of disadvantaged population from developing nations (Batchelor et al. 2003). After executing numerous ICTs-led initiatives in developing nations, Information for Development (infoDev), a research associate and a partner of World Bank, outlines a number of advantages offered by ICTs, in the form of information access and resultant socio-economic empowerment attained by disadvantaged populations from developing nations. After being introduced to ICTs, disadvantaged populations from developing nations experience an increment in opportunities to access resources and use capabilities through improved access to information, empowerment through information about choices that affect them, and a decrement in vulnerability to risk due to the possibility of information exchange (McNamara 2003, Myhr and Nordström 2005).

Mobile devices in the form of cell phones, personal digital assistants (PDAs), laptops and walky-talky have been extensively used for handling, sharing, and disseminating information thereby shaping everyday information behavior of disadvantaged populations from developing nations (infoDev 2008). Everyday information behavior predominantly consists of understanding, conceptualizing, and theorizing everyday information needs and information-seeking of individuals from users’ perspectives (Bates 2004).

Various direct socio-economic advantages and intangible benefits of mobile technologies lead us to believe that after being introduced to ICTs, disadvantaged population’s (information) behavior related to information seeking, searching, receiving,
handling, processing, and using, is shaped gradually over a period of time; and this information behavior acts as one of the enablers for the disadvantaged population to take advantage of socio-economic opportunities generated and introduced by ICTs (See Figure 2). This dissertation explored the linkage between cell phones and the information behavior experienced by disadvantaged cell phone users; and the role of cell phones in shaping that information behavior with its implications on socio-economic opportunities.

Figure 2: Dissertation Research Exploring the Linkage between Cell phones (an ICT) and Information Behavior with its Implications on Socio-economic Opportunities opened up for Disadvantaged Women from Rural India

With the limited amount of resources available to a doctoral student, it was impossible to reach the entire disadvantaged population from all developing nations, in order to understand their information behavior due to their exposure to cell phones. Hence, it became necessary to apply stratified sampling techniques to locate a sample representing one of the most disadvantaged populations engaged in some common activities (Fowler 1993). As a result of this sampling process (discussed in detail in sections 3.2 and 3.3), this dissertation used a set of disadvantaged women from rural India as a representative of disadvantaged populations from developing nations.
1.1.1 Two-tiered Research Problem

To study the information behavior of disadvantaged women using cell phones from rural India, Revised General Model of Information Behavior (Wilson 1997) – referred as the Model here onwards - one of the most comprehensive and widely accepted models in the field of information behavior was used. As a result of a stratified purposive sampling technique, financially disadvantaged women who earn less than $1 per day, a poverty cut-off defined by World Bank (2008), were studied to explore the linkage between cell phones and the information behavior.

The broader research problem or the first order research question for this dissertation research was:

How do cell phones shape the information behavior with its implications on socio-economic opportunities explored by disadvantaged women from rural India? Since, the Model was used to explore this broader question, five constructs from the model led to the secondary level or second order research questions:

How do various intervening variables affect information behavior of disadvantaged women from rural India? Economic, social, inter-personal, cell phone characteristics, psychological and demographic factors are considered as intervening variables. Finally, how do various activating mechanisms influence information behavior of disadvantaged women from rural India? Activating mechanisms considered by the Model and described in section 2.2.3 include stress/coping theory, risk/reward theory, and self-efficacy theory.
1.2 ICT-led Socio-economic Opportunities in Developing Nations

Studies have demonstrated that ICTs, especially mobile technologies, have improved social links by creating social capital, enhanced market information flow and productivity, as well as increment in GDP and direct foreign investment (GSM Association 2007). A number of initiatives sponsored by various government, non-government, and public-sector organizations promote applications of ICTs for offering socio-economic opportunities to disadvantaged populations in developing nations. Evidences suggest that benefits of ICTs are found not only in white-collar class of software programmers or call-center operators but also in blue-collar class of workers, farmers, fishermen, artisans, and similar others from developing nations (Jensen 2007). People from developing nations perceive ICTs to have a great impact on their social networking and economic vulnerability (Souter et al. 2005). The economic impact perceived by disadvantaged people is greater for saving money (for example, making trips) than for earning money (Myhr and Nordström 2005). For example, ICTs have been used to increase disadvantaged Kenyan women’s income (Abantu 2008), to increase sales and find new buyers for artisan producers worldwide (PEOPLink 2008), to distribute information on economic opportunities for Brazilian women (CEMINA 2008), to increase profit margins and sales volumes of Indian women’s marketing and production groups (FOOD 2008), to attract small and medium enterprise investments in poor areas of Siberia (SibDev 2008), and many more.

The deployment of ICTs either offers direct services to people or demands new ICT-related skills to be acquired by them. In any event, in order to get benefited from such ICT-led initiatives, beneficiaries are expected to change their information behavior (Spink and Cole 2001). Some of the indirect effects of ICTs involve: development of entrepreneurial skills, reduction in information asymmetries and market inefficiencies, and
substitution of transportation (Bhavnani et al. 2008). ICTs have also been observed to increase marketable skills of Latin American disabled people (OAS 2008), to improve knowledge of Kenyan health care professionals (Satellite and HealthNet Kenya 2008), to increase marketable skills of Brazilian teenagers and young adults in slums (RITS/ Sampa 2008), to bolster Russian pediatric medical staff’s care management efforts to fight against cancer (VRF 2008), and similar others.

1.2.1 Mobile Technologies: A Set of Leading ICTs Driving Socio-economic Growth in Developing Nations

According to the Global Information and Communications Department of the World Bank, “Mobile telephony has a positive impact on the economic welfare in the following direct ways: (a) by generating Gross Domestic Product (GDP); (b) by job generation (both in the mobile industry and the wider economy); (c) productivity increases; and (d) taxation revenue (mobile operators are usually a sizeable contributor) (Bhavnani et al. 2008, pp. 12).” In a typical low-income country, 10 extra phones per hundred inhabitants are found to lead 0.59% extra annual GDP growth (Waverman et al. 2005). Mobile technologies have already started making a profound economic contribution to Sub-Saharan Africa, through their positive impact on employment, increased business efficiency, tax revenues and GDP (GSM Association 2006). In developing nations, 1% increase in mobile penetration rates are found to be associated with 0.5-0.6% higher rates of foreign direct investments (FDI) and GDP (Williams 2005). Mobile technologies have also been identified as one of the most effective ICTs to address other everyday-life problems including but not limited to poverty, health, and education of disadvantaged populations from developing nations (Wild 2003, Kiki and Lawrence 2006).
The development of information economy is being driven by rapid innovation in communication and computing technologies which have reduced dramatically per the unit cost of switching and transmitting information on networks. (OECD 1998, pp. 15)

The adoption of cell phones by fishermen and wholesalers in Africa and southern states of India leads to a dramatic reduction in price dispersion (defined as a variation in prices across sellers of the same item, holding fixed the item's characteristics), the complete elimination of waste, and near perfect adherence to the Law of One Price (i.e. the price of a good should not differ between any two markets by more than the transport cost between them), the first fundamental theorem of welfare economics (Jensen 2007).

A range of stakeholders, local unions of fishermen and farmers, government offices, and local mobile service operators are usually involved in facilitating the process (Manobi 2008). Mobile devices help them to check better prices for their goods online. Through online communication, once they locate a marketplace fetching better prices to their goods on that particular day, they physically visit that place to earn more profit. This in turn helps to control heavy fluctuations in goods’ prices (Waverman 2007). Mobile devices are also found to increase marketing channels for African farmers and fishermen (B2BPriceNow 2008). In addition, cell phones reduce risks for fishermen who are exposed to undesired circumstances like emergencies in sea (Myhr and Nordstrom 2005). Due to all such advantages of cell phones, consumer interest for cell phones is growing rapidly all over the world.

1.2.1.1 How does it work?

Living standards for disadvantaged populations from developing nations are largely determined by how much they get for their output. The functioning of output markets plays a central role in determining the income levels of disadvantaged populations from
developing nations (Jensen 2007). Traditionally, information has been considered as a critical element of efficient functioning of markets. ICTs reduce the dispersed state of markets in developing nations and bolster communication infrastructure setup among disadvantaged populations in developing nations. This not only leads to creating better socio-economic opportunities for consumers but also for producers in developing nations.

Cell phones also have many intangible benefits which may not have direct economic benefits and may be difficult to value. Some of the intangible benefits of mobile telephony enhance and promote the growth of culture, society, and societal ties. The Global Information and Communication Technologies’ Analytical Report on deployment of ICTs reveals that cell phones have been used as tools to aide disaster relief efforts, to disseminate locally-generated and locally-relevant health as well as educational information, and finally to promote social capital and social cohesion (Bhavnani et al. 2008). Cell phones are found to be facilitating three most common types of social capital: as an amenity and shared commodity, to mediate strong links (with family, friends and other community members), and to mediate weak links (with individuals ‘outside’ the community, for example, businessmen, government officials, and alike) (Goodman 2005).

1.2.2 Recognition of the Role of Mobile Technologies

It is becoming a high priority issue for many international social organizations and non-profit organizations to address issues like poverty, education, health, and many more, in developing nations through efficient flow of information using mobile technologies (Batchelor et al. 2003). With the help of mobile communication devices, private organizations like Voxiva lower the Peruvian poor’s vulnerability to income shock by improving disease surveillance and response (Voxiva 2008). Information for Development of Program (infoDev 2008) runs mobile-banking initiatives such as Fundamo (South Africa),
Safari.com (Kenaya), MTN Banking (South Africa), Celpay (South Africa) for disadvantaged populations in Africa. SMART and GLOBE, two cell phone operators in Philippines, are pioneers in starting a range of banking services operated through cell phones in the country (Ayers and Trucano 2006). On an average, SMART customers send US$50 million worth remittance to their families, friends, and relatives back in Philippines through their cell phones (Ayers and Trucano 2006); this illustrates immense potential associated with mobile banking, especially in developing nations.

1.2.3 Dramatic Spread of Mobile Technologies in India, a Developing Nation

The first billion mobile phones took approximately 20 years to sell worldwide. The second billion were sold in 4 years. The third billion were sold in 2 years (Bhavnani et al. 2008). Coverage of mobile telephony has expanded and mobile phone subscriptions in developing countries have increased by over 500% since 2000 (GSM Association 2006). Studies by the International Telecommunications Union (ITU) indicate that of the world’s mobile subscribers only 33% were in the developed world with the remaining 67% in the developing world at the end of 2006 (ITU 2007). Figure 3 suggests exponential penetration of mobile technologies in huge markets of developing nations such as India.

Figure 3: Explosive Growth in Indian Telecommunication Sector
Source: TRAI 2007
Due to a set of conducive government policies, and private-sector telecom organizations’ fierce sales efforts and competitive marketing strategies (Reliance Report 2006), cell phones’ footprints have been able to cover 90% of the population from developing nations (infoDev 2007). Private sector investments assisted by a favorable enabling regulatory environment are identified as main drivers for the explosive growth of cell phones worldwide (GSM Association 2006).

There are unprecedented market opportunities even in the Indian Telecommunication Industry. As of February 2008, the total wireless subscribers (GSM, CDMA and WLL (F)) base in India stood at 250.93 million (Gupta 2008). India hosts the second largest wireless network in the world preceded by China (Gupta 2008). However, like many developing nations, the telecom industry in India is controlled by the government. Private telecommunication operators can practice only after seeking a license from the Indian Government, thus virtually being controlled by the government. As of March 2008, there were overall only twelve licensed cellular service providers with varying degrees of coverage in India; namely, BSNL (Bhartiya Sanchar Nigam Limited), MTNL (Mahanagar Telecom Nigam Limited), Bharati Airtel Limited, Tata Teleservices Limited, HFCL Infotel Limited, Idea, Hutch, Spice, BPL, Airtel, Shyam Telelink Limited, and Reliance Communications Limited (TRAI 2007).

The standard rate structure defined by the Telecom Regulation Authority of India (TRAI), a government body which regulates the entire telecom industry of India, makes it affordable for financially disadvantaged populations to take advantage of mobile communication. In January 2007, TRAI passed the 44th amendment for Telecommunication Tariff. It prescribed a composite ceiling roaming charges for cell phones as follows: Rupees
(Indian Currency) 1.40 ($ 0.033) per minute for outgoing local calls, Rupees 2.40 ($ 0.057) per minute for outgoing National Long Distance Calls, and Rupees 1.75 ($ 0.042) per minute for incoming calls. Receiving Short Message Service (SMS) was made free for all the cell phone subscribers. Cell phones sold at affordable rates in combination with very cheap tariff rates act as catalysts to a widespread usage of mobile devices; this eventually leads to an explosive growth of subscriber base for mobile telecommunication industry in India. The Wireless Industry in India crossed the 165.11 million-subscribers mark at the end of the financial year 2006-07. This total subscriber base of 165.11 million is comprised of 120.47 million GSM and 44.64 million CDMA subscribers (TRAI 2007).

Primarily, voice services are offered by the Indian telecommunication market, along with some value-added services including SMS and mobile Internet which consists of emailing, chatting, and video conferencing over the cell phone. Indian licensed service providers have extended various innovative services such as General Packet Radio Service (GPRS), Closed User Groups and Enhanced Data rates for Global Evolution (EDGE) Data services to meet ever increasing information needs of their customers (TRAI 2007). Such enhanced mobile services enable users to conduct conference calls and run multi-media applications on their mobile devices at the same time.

Through various marketing strategies (private sector) and social initiatives (public sector) organizations introduce mobile technologies to various strata of the Indian society. Indian society is inherently diverse in terms of socio-economic, cultural, linguistic, demographic, and geographical attributes. Various private sector organizations perceive such diverse society (approximately 1.1 billion in 2007 with only 5% of cell phone holders [See Appendix A] as a potential market for cell phones and related technologies in the near future.
(Reliance Report 2006). Government of India has set the goal of doubling the tele-density in rural areas from 2% to 4% by the year 2010 (TRAI 2007). Many public sector organizations have also been introducing variety of mobile technologies in enhancing the efficiency of business processes.

1.3 Why is Cell phone considered as an ICT for Dissertation Research?

Mobile telecommunication has emerged as one of the major catalysts of economic and social development for disadvantaged populations from developing nations (GSM Association 2006). Mobile telephony offers an attractive solution to many rural poor individuals and communities, with its general accessibility, collective ownership models, and flexible payment options (Sinha 2005). As of December 2008, cell phone was the fastest spreading ICT in the entire world (ITU 2009). Hence, this dissertation research used the cell phone as a representative ICT to study the information behavior of disadvantaged women from rural India.

Muhammad Yunus, the founder and director of the Grameen Bank in Bangladesh, claims that there is a direct correlation between mobile telephony and poverty alleviation (Sinha 2005). “The quickest way to get out of poverty right now is to have one mobile telephone.” This comment made by Muhammad Yunus, a Nobel laureate, reinforces the notion of considering cell phones as a representative ICT, especially in the context of dissertation research goal which explored the linkage between ICTs and the information behavior that enables disadvantaged populations to explore socio-economic opportunities.

According to the Global Information and Communication Technologies Report (Bhavnani et al. 2008), many pricing models of mobile technologies that include inexpensive handsets, micro prepayments, and top-up cards, offer affordability and choice, even for very
low-income customers. Sharing of cell phones through SIM cards and payments for air-time through micro-payments, promotes rapid adoption of cell phones by disadvantaged populations from developing nations. From suppliers’ point of view, establishing mobile masts is a relatively inexpensive way of serving large and remote rural areas, when compared to the fixed line telephony in developing nations (Bhavnani et al. 2008).

Two-way communication methods in the form of text and voice make usage of cell phones very flexible for all users. Furthermore, the cell phone has emerged as the most easily accessible and ubiquitous communication device in rural areas (Bhavnani et al. 2008). Easy availability of low-priced new handsets with basic features and emergence of secondary markets for used devices whose prices are even lower, make cell phones within reach for even the poorest of the poor.

Thus, due to mobile technologies’ ease of use (Manobi 2008), financially affordable nature (Voxiva 2008), and low infrastructure set-up costs compared to the Internet (Batchelor et al. 2003), cell phones have become very popular all over the world, including communities of disadvantaged populations from developing nations (infoDev 2008). Therefore cell phone, the most widely used technology by disadvantaged populations from developing nations, best suited as an ICT required for this dissertation research study, thereby creating a focus in the research design.

1.4 Expected Results

Dissertation research was expected to reveal the information behavior details of disadvantaged women, who own and use cell phones and earn $1 per day in rural India. Since the Model (Wilson 1997) was used to explore the linkage between the information behavior of disadvantaged women from a developing nation and their adoption of cell
phones, the set of expected findings were expected to reveal the performance of this model’s constructs along with the role of cell phones in shaping the information behavior of a chosen sample. The Model was originally developed in the Western context, using data collected from users in the West. In the context of disadvantaged women from developing nations, dissertation research evidence was either expected to end up confirming constructs from the model or the research could have challenged the robustness of the model, when applied to a completely different context.
Chapter 2

Information Behavior

Literature Review of Reinforced Interdisciplinary Evolution

Since this dissertation research studied the information behavior of disadvantaged women from rural India and the role of cell phones in shaping that information behavior, the research study found its theoretical foundation in the young and vibrant research field of information behavior with the emphasis on disadvantaged populations. This interdisciplinary field is grounded in the field of library and information science (LIS). Since the inception of the field in 1940s, multidisciplinary tools from hermeneutics, cybernetics, and semiotics have been extensively applied to study information behavior. Many complementary models studying information behavior, including the Model, attempt to organize fundamental concepts in the field. The literature review explored the field of information behavior by applying the organization offered by the Model. Various constructs from the model were found to be heavily informed by research contributions from a myriad of research disciplines beyond LIS.

Findings of the review are proposed using an Interdisciplinary Reinforcement Model (See Figure 5 Below). The interdisciplinary nature of the information behavior field leads to a wide range of applications in science, technology, and management. Interdisciplinary applications of the field along with interdisciplinary research contributions to the field of information behavior, in turn, give rise to a number of emerging subareas for information behavior research. This reinforces the interdisciplinary evolution experienced by the information behavior field.
Using the existing body of multidisciplinary research literature, the first section in this review offers a brief introductory overview of the field of information behavior and delineates key milestones in the field. The second section reviews the field of information behavior through the lens of the Model which is one of the most comprehensive information behavior models. The third section depicts the interdisciplinary applications of information behavior and emergence of various research subareas of information behavior as an offshoot of its interdisciplinary applications. The Interdisciplinary Reinforcement Model is proposed to represent findings emerged from the review of the field of information behavior. The model depicts the reinforcement of the interdisciplinary nature of the field of information behavior. The fourth section synthesizes the cyclic effect observed for the ever evolving information behavior field. This effect explains the ways in which interdisciplinary nature is reinforced for the field of information behavior. The fifth section expresses a possibility of refining pre-existing theories of information behavior, when applied to a different context such as the usage of cell phones by a disadvantaged population in a developing nation.

2.1 Introduction to the Information Behavior Field

Research contributions from science, technology, and social sciences dating back as late as 1940s, have not only enriched the field of information behavior but also helped it evolve significantly. The field is alternatively referred to as human information behavior. In 1948 for the first time, public presentations on the information behavior of scientists and technologies were delivered at the Royal Society Scientific Information Conference (The Royal Society 1948). In the early phase of information behavior, from 1948 to 1965, the research focus was on the information-need-oriented research. A number of document-focused studies were carried out as a part of the information behavior research (Wilson
One of the most rigorous research studies correlating information needs with information behavior of ordinary citizens was carried out in 1972-73, Baltimore, USA (Warner and Murray 1973).

Since the 1980s, information behavior research experienced a gradual shift from the system-centric approach to the person-centric approach (Wilson 2000). Many significant theoretical contributions nurtured the person-centric research developments in this field. The theory of small world explains the person-centric information behavior which is a characteristic of a small world one lives in (Chatman 1991). The information behavior has also been represented as a continuous processing flow of satisficing and optimizing behavior of users (Nahl 2007). The theory of normative behavior illustrates the fact that an individual demonstrates information behavior which is perceived as the most appropriate to the context in which he/she lives (Chatman 2000). The significance of information environment and information context emerged with the development of person-centric research approach. The information behavior has been intimately correlated with changes in information environment with information processing and the interactions between human agents, and information sources as some of the key controlling factors (Steinerova’ and Susol 2005).

So far there have been a number of approaches and tools, proposed and applied for studying information behavior. The information behavior researchers have been using tools from hermeneutics, cybernetics, and semiotics to define parameters and nature of the research in the information behavior field (Herold 2001). A set of three congruent methods namely, taxonomic, psychodynamic and ethno-methodology form one of the most popular approaches in the field (Nahl 2001).
2.2 Exploring Information Behavior through the Lens of the Model

The literature review applied structure extended by the Model (Wilson 1997), to review various concepts explored in the field of information behavior. In LIS, there are number of information behavior models grounded in the Western context. The models focus heavily upon learned or educated users’ active information search methods (Ellis et al. 1993, Kuhlthau 1991). However, these models do not quite address information needs and information search methods practiced by populations from developing nations, especially disadvantaged populations from developing nations. This dissertation aimed to fill in this theoretical gap. Some models attempt to evaluate relationships among contexts in which information needs arise and information needs are satisfied (Dervin 1983). Nonetheless, a majority of the proposed models in the field of information behavior are complementary in nature rather than being conflicting (Wilson 1999a).

2.2.1 What is Revised General Model of Information Behavior?

Wilson’s Model, one of the most widely accepted information behavior models, has been evolved as a result of the extensive research carried-out for more than two decades (Wilson 1997). Based upon the formal body of scholarly research, this model explores different aspects associated with the information behavior informed by allied research areas including but not limited to decision-making, innovation, consumer behavior research, marketing, psychology, health communication research, and information systems design that take into account users as the focus of interest (Wilson 1994, 1997). The model provides a more general framework by integrating contemporary models on the information behavior research (Wilson 1997). This model is based upon two key prepositions. The first is that information needs are a secondary type of needs that arise out of a set of primary needs in everyday life; and the second preposition focuses on various
barriers encountered by users during information search and acquisition (Beverley et al. 2007).

The Information Behavior is defined as…

[T]he totality of human behavior in relation to sources and channels of information, including both active and passive information-seeking, and information use. Thus, it includes face-to-face communication with others, as well as the passive reception of information as in, for example, watching TV advertisements, without any intention to act on the information given (Wilson 2000, p.49).

The Model (See Figure 4) identifies information needs and the contexts in which those needs arise, various mechanisms that decide whether needs experienced require information seeking or not, myriad of intervening variables that create barriers or encourage the need of seeking information, different incentives associated with the need of seeking information, and ultimately the actual process of information seeking which might be either active or passive with respect to a source of information. Some types of information needs demand information seeking behavior whereas some simply do not; this phenomenon is derived from the Stress/coping theory (Folkman 1984), which acts as one of the constructs in the Model. There are certain incentives associated with every source of information. The Risk/reward theory provides rationales for preferring certain sources of information over others (Murray 1991, Settle and Alreck 1989). According to the model, in the due process of seeking information, people often engage themselves in exchanging information with others depending upon sources’ political, social, and economic contexts (Wilson 1997).
The Social learning theory covers a conviction possessed by someone, that he/she would successfully execute the behavior to produce desirable outcomes (Bandura 1977). This is also referred as self-efficacy phenomenon. Thus, the need for information gives rise to seeking information, exchange of information, and processing and using acquired information (Losch and Lambert 2007, Wilson 1981, 1999b).

The Model organizes the entire field of information behavior into five constructs; namely context of information need, activating mechanisms, intervening variables, information-seeking behavior, and information processing and use. Following sub-sections review the field of information behavior using the above constructs as a guideline. An
insightful synthesis of relevant interdisciplinary literature for those constructs reveals the interdisciplinary nature of the field of information behavior. *Interdisciplinary Reinforcement Model* (See Figure 5 below) depicts the interdisciplinary nature of the field of information behavior. The following sub-sections provide a review of the field of information behavior through five constructs of the Model, when applied as a lens.

### 2.2.2 Context of Information Need

**The First Construct to review the field of Information Behavior**

The first construct from the Model reviews context in which information needs are realized and its impacts on information users. Need is “[A] subjective experience that occurs only in the mind of the person in need and, consequently, is not directly accessible to an observer” (Wilson 1997, p.552) except in situations like (need of food) hunger. Subjective judgment of someone else’s need is a cognitive representation of a future goal that is desired (Burnkrant 1976). Information need is sometimes difficult to specify, even by the user (Belkin et al. 1982). In any event, different needs experienced by human beings can be broadly categorized into the primary needs – food, clothing, and shelter, and the secondary needs – health, education, and monetary support.

Information needs of an individual also determine whether the process of search for information needs to be carried out individually or in a group (Reddy and Jansen 2008). There are varieties of information needs which are highly correlated with the contexts presented in various research studies. After studying information needs of rural women in Botswana in Africa, Mooko (2005) found that health, agriculture, employment, family violence, and basic needs for the families were the key information needs of rural women in Botswana. All of these information needs were grounded in the context of families. Some
of the secondary information needs were information on government-aided funding, welfare subsidies and policies, and training. Artisan farmers represent marginalized populations in Africa. A five-layered schema of information needs developed for artisan farmers includes the socio-economic conditions, the socio-institutional and macro-economical factors, the production technology and economic efficiency status, the cost structure and profitability state, and the marketing system respectively (Panayotu 1985).

For marginalized populations in developing nations, information needs can heavily influence not only their way of life but also their existence. While exploring intimate connection between information needs with the existence of local communities in South Africa, Kaniki states

Information needs manifest themselves in the form of tasks of users or potential users … The information needs of people were basically related to personal existence, survival and development… All these problems, even if solved, were not ultimate goals in themselves. Solving these problems seemed to provide 'avenues' for attaining a better life or livelihood, that is, overcoming unemployment or finding means of earning an income (Kaniki 1995, p.5).

Decision-making process, user characteristics and profiles, contextual and environmental influences on user behavior, and common communication processes are some of the key issues addressing the nature of information behavior in the context of consumer behavior research. The lifestyle of users and environmental influence which includes reference groups and situations help human beings to determine sources to satisfy information needs (Rowley 1999).

If information needs are associated with communities, then internal changes and features associated with community greatly shape the information needs identified, associated, and satisfied, using limited resources available to the communities. Changes
internal to the communities in South Africa and the nature of those communities are reflected in importance, magnitude, and priorities of information needs of those communities (Kaniki 1995). From a focus group study regarding information needs of 164 low-income, primarily African-American residents from a community, a study confirms that their information needs such as community services and activities information, crime and safety information, and general reference tools were grounded in the context in which they live; whereas the information needs such as resources for children, healthcare information, employment information, and education information were based upon their personal and family lives (Bishop et al. 1999).

The studies show that information needs of users practicing the same profession do not necessarily coincide. Instead, the objectives and goals of the process that gives rise to the information needs significantly influence information needs of users. Information needs study of the artisan fisher folks in Uganda reveals that information needs of those fisher folks were heavily clustered around their work related practices and information that promote their jobs. These information needs were rooted in the contexts formed by climatic conditions for fishing, illiteracy affecting entrepreneurial capabilities, general fishing habits, cost of equipments used for fishing, and poor management facilities for storing fish (Ikojo-Odonogo and Ocholla 2003). Results from one of the similar research studies conducted for information needs of fishermen in Niger Delta region in Africa were quite different. The most essential information need was regarding the ways in which loans and credit could be obtained for the expansion of fishing operations (Dekur 1996). Despite being from the similar regions in Africa with the same profession – such as fishing – fishermen had different information needs. This illustrates the significance of context in which information needs arise.
The context is a very multifaceted concept which can be defined on multiple lines in the field of information behavior (Pettigrew 1999). The definite time span associated with term context varies significantly. A study suggests that context can be as broad as a lifespan of work and as small as a web search (Solomon 2002). The term context also depends upon different paradigms associated with information (Dervin 1997). In order to underline the significance of context for information behavior research, Kuhlthau (1999, p. 10) states

"To neglect context is to ignore the basic motivations and impetus that drives the user in the information-seeking process."

Local circumstances for black, urban South African communities emerged as the basis of their information needs. This suggests the significance of local norms and local circumstances before making any judgments for recommendations and deriving any conclusions about specific information needs associated with the communities (Bekker and Lategan 1988).

There is a feedback mechanism observed in terms of contexts and information needs. The context shapes information behavior which, in turn, reinforces features of the context. Features associated with information contexts vary according to user needs, types of users, and types of processes implemented in satisfying information needs. In an ethnographic study of the information behavior of community clinic attendees, four types of contextual factors such as physical environment, clinic activities, the nurses’ situation, and the seniors’ situation were identified as controlling variables shaping their information behavior (Pettigrew 1999). The context of information needs might get formed due to the physical disabilities as well. At the end of a study of visually impaired population seeking
health information, it was demonstrated that the degree of independence of visually impaired person, their acceptance of their own visual impairment status, their interactions with health service providers, and support from friends and families did not only influence their information needs but also their overall information behavior (Beverley et al. 2007).

Characteristics of contexts substantially affect information needs in different ways. Findings from the research study of a battalion of 300 to 1000 soldiers on a battlefield suggest that it is impossible for a single person or a group to acquire the diverse and often rapidly expanding information needs; information needs arose in such dynamic contexts induce collaborative information behavior (Sonnenwald and Pierce 2000).

Contexts influence not only the nature of information needs that arise but also the nature of information which is perceived to be satisfied by the users. Results of a study focusing on information needs of young students attending schools in Sweden reveal that schools act as optimum contexts for the students using information available in the context of those schools (Gross 2004). Schools act as highly convenient source for satisfying information needs of young students who are information users. Schools end up defining students’ information needs in particular manners (syllabi) and also act as source of information (libraries, teachers, etc.) for those information needs (Meyers et al. 2007).

Context specific insights can be applied in deriving knowledge about an information flow among various users in those contexts. In turn, the same information flow could potentially influence the composition of the contexts. Interactions among various contextual factors responsible for information behavior form a common information ground which is useful to understand information flow in community settings (Pettigrew 1999). Sonnenwald and Pierce (2000) discovered that bi-directional information
flow among individuals in dynamic contexts, helps building team-spirit, improving team performance. Continuous flow of information builds a dense social network through which interwoven situational awareness can be established.

Psychological conditions and attitudes of users represent external factors that shape information behavior in a particular context. Self-motivation is likely to inspire users for more information needs and to seek better quality information sources. Motivation surfaces as the most significant factor in an intra-individual information behavior research study. Motivation could be internal, where a user experiences an urge for information needs, or external, where some external entities impose information needs on users (Julien and Michels 2004). Creativity of an individual and effort put by an individual act as evidences for internal and external motivations (Ryan and Deci 2000). The above mentioned research contributions from Psychology (Julien and Michels 2004), Battlefield Planning and War Administration (Sonnenwald and Pierce 2000), Health Administration (Beverley 2007), Developing World Studies (Dekur 1996), Social Sciences (Panayotu 1985), Decision-making Sciences (Rowley 1999), and LIS (Meyers et al. 2007) confirm the interdisciplinary nature of the field of information behavior, depicted in the Interdisciplinary Reinforcement Model (See Figure 5 Below).

2.2.2.1 Person-in-Context

The concept of a person-in-context from the Revised General Model of Information Behavior indexes to the process in which a person or a group of individuals act as gatekeepers of information, facilitating the process of realizing information needs, seeking information, processing it, and applying it in appropriate ways (Wilson 1999a). There is a strong hold of internal and external contexts over setting up information needs
and the degree of searching information (Foster 2004). The decision of stop looking for information, selection of information sources, and its information content are significantly influenced by the external functions such as context, setting, and situation (Marchionini 1995). Collectivist theoretical framework emphasizes the significance of context and people for studying information behavior; the framework reveals influence of a group-setting as a context not only for filling up information gaps but also for participants’ needs to socialize. Information needs arose in the context of a group-setting lead to forming a caring community and developing collective information practices (Prigoda and McKenzie 2007).

Information behavior demonstrated by an individual in a specific context is highly affected by the features of that context. While studying information behavior of a visually impaired group, a research discovered that a user group’s surrounding health conditions, their disabilities, and their awareness about that particular context were some of the key factors in assessing information and shaping overall information behavior (Beverley et al. 2007). The research focusing on the influence of context on information-gathering behavior of users proposes that in a very demanding information environment within a specific business context, line managers tend to accumulate informal information in their cognitive savings account. In a very high pressure, high workload business context, while making decisions, these information users tend to equally use informal information stored in bits and pieces along with information acquired through formal procedures (Mackenzie 2003). A research study carried out in an academic setting with a goal of studying what is enough in terms of information gathering shows that

[T]he situational context of both the participants’ specific information needs and their role in an academic society affects every stage of their search – from the selection of the first resource, to ongoing search strategies, to decisions on how much
information is enough (Chandra Prabha et al. 2007, p.74).

Information exchange and communication among various groups and information users influence outcome associated with the overall information behavior. Findings from a research study involving electronic reserve auctions (e-RAs) suggest that supplier-buyer relation is strongly positively correlated with the quality of information exchange and communication between both parties (Losch and Lambert 2007). Information systems launched for various information intensive business processes, information intermediaries, and various web portals act as decision points for releasing information to others.

2.2.3 Activating Mechanisms

- The Second Construct to review the field of Information Behavior

The second construct from the Model proposes the need of an intermediate stage between determination of needs and initiation to satisfy those needs (Wilson 1997). A set of activating mechanisms address that need of intermediate stage. Various activating mechanisms identified under the Model are Stress/coping theory, Self-efficacy, and Risk-reward theory (Wilson 1997). One of the suggested definitions of stress from the Psychology literature is

[A] relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and as endangering his or her well-being. (Folkman 1984, p. 840).

There are two types of coping namely, emotion-based coping and problem-focused coping. The stress/coping theory takes into account users’ orientations towards threats and turning away their attention from those threats. It refers coping as cognitive and behavioral effects
to master, reduce, or tolerate the internal and external demands that are created by stressful situations (Folkman and Lazarus, 1985).

Self-efficacy, the second type of activating mechanism, also known as a sense of personal mastery, serves as the central construct in the Social Cognitive Theory. An outcome expectancy is defined by Bandura (1977, p. 193)

[A] person's estimate that a given behavior will lead to certain outcomes. An efficacy expectation is the conviction that one can successfully execute the behavior required to produce the outcomes. Outcome and efficacy expectations are differentiated, because individuals can believe that a particular course of action will produce certain outcome, but if they entertain serious doubts about whether they can perform the necessary activities such information does not influence their behavior.

Even though the concept of efficacy expectations was developed in the field of Psychology, it can also be generalized to other fields. The concept is based upon four major sources of information: performance accomplishments (i.e. carrying out the actions oneself) vicarious experience (or learning from others), verbal persuasion (which may include self-instruction), and physiological states – particularly emotional arousal (Bandura 1977). Thus, the theory of self-efficacy clearly makes connections with coping strategies in the context of information behavior (Wilson 1997).

Typically, available choices and types of search efforts lead to form a risk-reward model which is considered as the third type of activating mechanism by the Model (Wilson 1997). Financial resources of users often act as constraints for adopting or using any
specific product or service as a part of information behavior. Typically, users assess a new product or a service with questions such as – Is the product affordable? Or should a cheaper product be found? Users might also evaluate the product or the service using their psychological and physical experiences with the questions such as – Is the product hazardous to health? Will the information-seeking process jeopardize currently owned properties? (Stigler 1961)

Studies from Consumer Research contribute to some additional types of risks experienced by users. Three components to “perceived risks” include: performance – whether a product would perform according to the expectations and standards or not, social – whether friends and colleagues would get impressed by a product or not, and, finally ego – whether a product improves person’s self-esteem and makes that user happy or not (Settle and Alreck 1980). Risks related to safety, risks related to losing time, and risks related to losing convenience also contribute to the set of risks perceived by users (Murray 1991).

Financial awards, production costs, social status, and self-efficacy act as some of the most prominent activating mechanisms identified in the field of information behavior. The above mentioned set of activating mechanisms build a theoretical bridge between the realization of information needs for seeking information and actual information-seeking initiatives by users. Self-efficacy image is closely related to attitudes of users. A research studying attitude of users discovered that one group of users prefer electronic sources for easy access to well-organized forms of information, whereas another group of users prefer traditional time consuming in-depth information processing, stressing the prestige of review and printing techniques. Financial costs in terms of actual production costs of publishing journals are found to play a significant role in dividing users’ preference for electronic
media and printing media (Steinerova and Susol 2005).

Risk taking attitudes of individuals affect the process of developing information sharing and awareness in a group-setting. Studies from collaborative information behavior focusing on inherent dynamic environments reveal the temporal and spatial relationships among objects on battlefields. This enhances the knowledge about judging risk taking attitudes, one of the many factors required to develop inter-group situational awareness (Sonnenwald and Pierce 1999). Uncertainty, a cognitive state of mind, leads to anxiety and stress. The seven-stage Information Search Process Model confirms stress as a product of uncertainty explained by uncertainty principle, an integral part of information behavior for any individual. Moreover, the process of information-seeking is initiated due to lack of users’ abilities and understanding of a gap in meaning (Kuhulthau 1991). The scholarly literature in this section reveals that even though various concepts of activating mechanism for information behavior are originated in the field of Psychology (Bandura 1977), they can be successfully applied to a variety of interdisciplinary areas as depicted in the Interdisciplinary Reinforcement Model (See Figure 5 below).

2.2.4 Intervening Variables

- The Third Construct to review the field of Information Behavior

The third construct from the Model explores the factors that either discourage or encourage users in the process of seeking, searching, processing, and using information gathered actively or passively (Wilson 1997). This construct is segmented into the following set of intervening variables such as psychological, demographics, role-related or interpersonal, and source characteristics.

Studies of impoverished people and retired women identified a level of secrecy
practiced by people in-need of information, their lack of risk-taking attitude, and deception in communicating information in the same community. The studies labeled above mentioned findings as environmental, psychological, and interpersonal types of intervening factors which create huge barriers to seeking information, degrading overall information behavior of individuals (Chatman 1992, 1996).

2.2.4.1 Psychological

We all hold certain beliefs and value systems in our lives. These beliefs and values always keep on reflecting in our almost all the actions. Any attempts to prove or disprove such beliefs and value systems that influence information behavior of users can act as psychological intervening variables. Sometimes, many conflicting ideas confuse naïve users, affecting the overall information behavior (Wilson 1997).

2.2.4.2 Demographic

Age, gender, and other relevant factors constitute demographic intervening variables which possibly affect information seeking, searching, and possibly, the overall behavior of users (Wilson 1997). Quite often, while studying the phenomenon of information behavior – employment status, socioeconomic status, ethnic origin, marital status, and co-habitation – are also considered as demographic factors. A research study suggests that the amount of health-related information used by users appears inversely proportional to the age groups of a population (Beverley et al. 2007). In general, women are more active in searching and receiving information compared to men, which confirms women’s role as care givers.

Responsibilities, especially family-related responsibilities associated with a set of demographic factors affect the information behavior of users. A study in a consumer
research reveals that women with children care more about information of nutrition and ingredients on specific products than women without any child. Concerns with children play out as a key motivating factor for information-seeking, searching, and their overall information behavior (Wilson 1997).

2.2.4.3 Role-related or Interpersonal

The socio-economic status of users seems to hold a high degree of correlation with the level of necessity realized for inter-personal communication. However, there is no consensus on the correlation between the need of inter-personal communication and the degree of socio-economic status of disadvantaged populations. Some studies suggest that marginalized populations need to look forward to interpersonal communication and non-establishment channels for the substantial portion of local news (Dervin and Greebberg 1972). Whereas, a research study titled *impoverished life-world of outsiders* contradicts the above mentioned findings by suggesting that users seek information from outside the community rather than from inter-personal communications inside a group (Chatman 1996). This was based upon a key finding that information of the most critical kind such as employment was not being asked or shared among community members. In addition, the study also found that some types of information require non-sharing channels of communication even in a closed group-setting (Chatman 1996).

2.2.4.4 Source Characteristics

Using Shannon’s (1949) source-message-channel-receiver model of communication, channels for information communication can be classified into two categories namely, *formal* channels of information – different sources of information accessing tools and *informal* channels of information – conversations with colleagues and friends (Spink et al. 2002). Users are often choosy when it comes to selecting information from a bunch of
information facts available from different sources. This is where exactly the characteristics of sources of information affect the process of selecting information from a particular source. From a surrounding environment full of messages, an individual selects the pieces of information or messages that fit the most to his/her needs and interests (Schramm 1973).

In today’s world, information is often being bombarded by more than one source of information. Family, schools, friends, broadcasting media such as television, newspapers, and radio, and a variety of technologies such as cell phones, Internet, computers, and laptops act as the most common sources of information. Every source of information has its own pre-requirement to qualify for receiving information. For example, to be able to read news from newspapers, literacy is one of the major pre-requirements; this is not the case for hearing news from friends or families. In a qualitative exploratory research carried out to improve library services including inter-library sharing adapted resources, it was found that technology and an active support network drastically enhance the information behavior of a sample population of visually impaired individuals (Saumure and Given 2004).

Language of a medium acts as a major barrier for information exchange, especially, if a population is not familiar with the language of information source. A study aiming to establish the level of media accessibility and use by the Kenyan rural women in the Kinangop area revealed that due to low literacy, the majority of the women could not comprehend radio transmissions in English and Kiswahili, two non-native languages (Ngimwa et al. 1997). Results of a research study involving electronic reserve auctions (e-RAs) suggest that the significance of information and information sources heavily depends
upon strict time constraints and the overall information intensive nature of electronic auction process (Losch and Lambert 2007).

2.2.4.5 Environmental

It is often the case that individuals receive information in bits and pieces from various sources and communication channels. Users are encouraged as well as discouraged by the surrounding environments for selecting or rejecting received sources of information (Schramm 1973). This is also supported by Chatman’s proposed Theory of Small World, where she found that

> [I]ittle contact with people outside their immediate social milieu and are only interested in the information that is perceived as useful, that which has a firm footing in everyday reality, and responds to some practical concern (Chatman 1991, p.537).

Immediate social milieu, i.e., environment influences people’s choice of processing information and acting on it. For disadvantaged populations, the process of understanding information needs itself is grounded in social environments which define information from users’ perspectives (Chatman 1996). The results from a study assessing information needs of an African-American, low-income population, lead to the Information Environment Model which relates types of information needs and mode of communication channels used (Spink and Cole 2001).

2.2.4.6 Economic

The Model takes into account the direct cost of products or services and the value of time as economic factors. Direct cost can be further categorized into the cost of searching information, the cost of retrieving information, and the cost associated with shopping done for just enjoyment and entertainment (Wilson 1997). A research study from
a consumer research indicates that due to similar alternatives, gains associated with search results diminish significantly; this reduces search efforts. This is also supported by the fact that value of time for information search associated with people with high income is usually greater than that of value of time for information search associated with people with low income (Stigler 1961). In contradiction to this proposition, another consumer research study indicates that in order to reduce uncertainty, customers end up increasing their search efforts for similar alternatives (Urbany et al. 1989)

There are various competing economic factors that act as obstacles in seeking, searching, processing, and using information in the lives of disadvantaged populations. In a research to study influence of media on information behavior of Kenyan women, it was found out that

[Despite rating the radio relatively high (26%) as the leading media for information compared to other media, several social and economic barriers including the lack of time to listen to radio programmes...served as hurdles (Ngimwa et al. 1997, p.46).]

Poor transport and telecommunication infrastructure related problems which are not exclusively caused by poor economic conditions of individuals create huge barriers for information seeking, searching, and the overall information behavior (Ngimwa et al. 1997). Research investigations from Mathematics (Shannon 1949), Communication (Schramm 1973), Economics (Stigler 1961), Finance and Information Systems (Losch and Lambert 2007), LIS (Spink et al. 2001), and Consumer Behavior (Urbany et al. 1989) focusing on various intervening variables confirm the interdisciplinary nature and interdisciplinary applications of the field of information behavior, as depicted in the Interdisciplinary Reinforcement Model (See Figure 5 below).
2.2.5 Information-seeking Behavior

- The Fourth Construct to review the field of Information Behavior

The fourth construct from the Model integrates relevant theoretical prepositions including information-seeking behavior and information-searching behavior. Information-seeking behavior has also been explored as an independent area of research by the Information Science research community. Information-searching behavior is perceived as a subset of activities related to seeking information. Information-seeking behavior has also been identified as an integral part of the general model of task performance and analysis (Rasmussen et al. 1994).

The research work on users of libraries and readership studies form the foundation for research on information-seeking behavior. The Royal Society Conference presentation of concerns for managing information and the way people or users understand information was the beginning of acknowledging the information-seeking behavior as a separate area (Wilson 2000). Information-seeking behavior can be defined as…

[T]he purposive seeking for information as a consequence of a need to satisfy some goal. In the course of seeking, the individual may interact with manual information systems (such as a newspaper or a library), or with computer-based systems (such as the World Wide Web) (Wilson 2000, p.49).


There is a wide recognition to information-seeking in many fields including but not limited
to Business Management (Miller and Jablin 1991), Computer Science (Bates 1989), Genetic Counseling (Roberts 2000), LIS (Yang 1997), Medicine (Leydon et al. 2000), Psychology (Miller 1987), Religious Studies (Wicks 1999), and Communication (Afifi 2002).

The Model asserts that any model on information-seeking behavior should be seen as, essentially, a part of information behavior. For a long period of time, \textit{active information-seeking} was implicitly considered as information-seeking behavior. Eventually, the term \textit{acquisition} (Aacker et al. 1997) was introduced to stratify information-seeking behavior into active and passive – attention and search components; the term \textit{acquisition} was later adopted by the Model (Wilson 1997). Passive attention involves user’s exposure to information from radio or television, or the reception of messages on cell phones. Thus, passive attention does not cover any sort of intentional information-seeking (Wilson 1997).

Decision-making, planning, and obtaining instructions are some of the key situations identified in information-seeking behavior, which eventually emerged as the research sub-area titled \textit{intra-individual information behavior}. The concept of situation was first studied in the face of information-seeking (Julien et al. 2002). It is composed of a set of information-behavior-related circumstances. It can be \textit{onsite} – where actual information-seeking takes place, or \textit{offsite} – where the user needs to physically visit some location, to get hold of information.

\subsection*{2.2.5.1 Information-searching Behavior}

The Model considers information-searching behavior to be a subset of information-seeking behavior. From a user’s perspective, retrieving information is one of the major steps in seeking information. Hence, information-searching activity (also known as information-retrieval behavior) emerged as a subset of information-seeking activity (Wilson
1999). A widely used typology of user behavior for information-searching includes complex searching, limited searching, quality searching, and lazy searching (Rowley 1999).

Information-searching behavior can be defined as

\[\text{[T]}\text{he ‘micro-level’ of behavior employed by the searcher in interacting with information systems of all kinds. It consists of all the interactions with the system, whether at the level of human computer interaction (for example, use of the mouse and clicks on links) or at the intellectual level (for example, adopting a Boolean search strategy or determining the criteria for deciding which of two books selected from adjacent places on a library shelf is most useful), which will also involve mental acts, such as judging the relevance of data or information retrieved (Wilson 2000, p.49).}\]

\text{Information-retrieval Model} for information-searching behavior focuses on user interactions with information-retrieval systems (Saracevic 1996). \text{Cognitive Model} studying information-searching behavior explores various processes of cognition involved in the information-processing steps (Ingwersen 1996). \text{Episode Model} exploring information-searching behavior of users takes into account interactions with information retrieval system as a sequence of differing interactions in an episode of information-seeking (Belkin 1995).

There are three types of information-searching behavior recognized by the Model. \text{Active search}, the first type, involves active seeking of information. The Model considers active information-searching as the principle component of information-seeking behavior. Typically, active search involves specific information as an output of the search that was initiated by individuals or organizations.

\text{Active ongoing search}, the second type of information-searching behavior, involves
ongoing search activities built upon pre-established framework of basic search. It is an extension of pre-existing information-base either formed by the user or by someone else. This information-base could be either knowledge, or ideas, or beliefs, or values (Wilson 1997). The frequency of updating original base of information may vary from a few minutes to more than a few years. Varying user needs – a function of time – shape information collected as a part of ongoing search (Wilson 2000).

*Passive search*, the third type of information-searching behavior, refers to a process in which one type of search or a behavior accidentally leads to another type of relevant information. Passive search typically leads to gaining unintended type(s) of information (Wilson 1997). Information-seeking behavior and information-searching behavior form a set of core attributes for the field of information behavior. The above scholarly research contributions from Business Management (Miller et al. 1991), Project Management (Rasmussen et al. 1994), Computer Science (Bates 1989), Genetic Counseling (Roberts 2000), LIS (Yang 1997), Medicine (Leydon et al. 2000), Psychology (Miller 1987), and Religious Studies (Wicks 1999) demonstrate the interdisciplinary nature of the field of information behavior and its interdisciplinary applications, as shown in the *Interdisciplinary Reinforcement Model* (See Figure 5 below).

### 2.2.6 Information Processing and Use

- The *Fifth Construct* to review the field of Information Behavior

The fifth construct from the Model explains the information behavior demonstrated by users after getting hold of information from various sources through different information-searching mechanisms. Information gathered from various sources does not, essentially, guarantee its incorporation with the users' frame of knowledge,
beliefs, or values. Also, information available in different formats does not necessarily lead to changes in the user's state of knowledge, behavior, values, or beliefs (Wilson 1997).

There are many factors related to economic and personal abilities, namely, *direct economic cost* to process information and value in terms of time, *cognitive abilities and knowledge* required to process information by the user, and *basic literacy and reading abilities* that are involved in deciding the possibility and rate at which information can be processed and applied (Hultgren and Limberg 2003, Wilson 1997, Wilson 1999). Sources of information leave different impacts on different users; for example, information derived from the news broadcasted on radio has varied degree of influence than the news derived from television or mobile.

Information sources and forms of information have an intimate relation with the process of applying received or gathered information through a variety of information-searching methods. High level use of newspapers and dense networking in a community give individuals a leverage to make use of information more productively (Dervin and Greebberg 1972). The need of information-seeking in combination with a context in which information is searched, shape the entire process of information usage. A research study in the Swedish context, examining information-seeking, use, and learning in the school context revealed that a strong relationship among school children’s ability to understand information-seeking and use, the nature of school assignments, the quality of access tools, and their experiences and knowledge significantly influence their learning outcomes (Hultgren and Limberg 2003). Learning outcomes are essentially end-products of processing information.

Overall, the process of information processing is very subjective and its association
with information-learning makes it difficult for others to observe (Wilson 1999). While making sense out of participants’ behavior and exploring the social elements of their information behavior, in the context of an annual work-planning of a public agency, a study found that the participants did not think information as something separate from the information-intensive task or a problem at hand. This leads to a potential disadvantage of deviating attentions of employees from basic issues, problems, and sense-making of tasks and situations (Solomon 1997). In particular, this holds true in the organizational settings that depend upon technological systems (for example – information systems) to gather, store, and process information. Hence, in order, to maintain the quality of information and its appropriate applications for specific issues and problems, it is necessary to ground and align the design and implementation of information systems in the organizational goals and vision (Solomon 1997). This caution could avoid many problems associated with information management, design, and implementation of information systems.

In the private sector markets, data smog makes it harder on consumers to make decisions about a particular product or a service, since consumers could hardly encode anything specific in their memories (Varian 1998). Data smog refers to a combination of data which makes a very little sense for making decisions based upon that data. This situation is similar to information overload. Information overload is a scenario in which users are bombarded with a variety of information presented in different forms (Varian 1998). Information intermediaries prove to be very effective, and hence, are in-demand, especially, in the context of information overload.

Information intermediaries, a human or a non-human party designed to assist users in information processing, are often used in markets to assist potential consumers
processing and applying those different pieces of information for desired tasks (Lee and Cho 2005). A research study of financial markets indicates that various factors increase the dependency on information intermediaries by a majority of potential consumers who are bombarded by loads of information (Waldfogel and Chen 2003). A low-level of perceived expertise in the financial management area, a large amount of total financial assets, and high opportunity cost of time exponentially enhances the perceived value of information intermediaries (Lee and Cho 2005). The introduction of information intermediaries in markets completely changes the dynamic of information search and overall information behavior demonstrated by information users. In the Internet environment, information intermediary emerged as a tool for information gathering as well as information sorting, affecting the overall information processing, use, and information relevant decision-making (Caillaud and Jullien 2001, Waldfogel and Chen 2003).

Thus while studying information behavior through the lens of the Model, complex landscapes of information contexts play a significant role not only in realizing needs for seeking information but also deciding ways of seeking information. Myriad of information-searching mechanisms form a subset of information-seeking mechanisms followed by processing the sets of information. Applications of the sets of information through appropriate channels of communication along with the concept of person in context suggest a potential research area related to information behavior and gate-keeping activities. In the future, it is required to explore a possibility of incorporating motivations of information users for the realized information needs and a level of willingness, as a part of the Model.
2.3 Interdisciplinary Applications of Interdisciplinary Field

The field of information behavior has periodically experienced confluences of ideas, concepts and applications from diverse research disciplines. In addition, relevant innovative theories, concepts and models proposed in other disciplines have created diverse applications of the field. Human-centered product designs and interfaces, consumer behavior research, innovation management, decision-making processes and designs and developments of information systems are some of the most widely acknowledged areas of applications for the information behavior. The knowledge about information behavior of individuals, groups and organizations has increasingly becoming crucial. In the era of global markets and tough competitions, highly customized, tailor-made applications and information solutions are desirable in many circumstances irrespective of their origin of industry. People as customers are attaining high value in terms of information accessing, handing, and sharing. Consumers expect better quality, information oriented solutions in a variety of forms from suppliers irrespective of their industry (Lee and Cho 2005).

Consumers demonstrate different types of information behavior patterns. Knowledge about customers’ abilities and ongoing trends of processing information help corporate world design better human-centered product designs and interfaces. Social norms and technological solutions can influence each other in a variety of different ways. For example: the primary purpose of devising mobile devices was to build a bridge of communication among people. But, often consumers discover a variety of commercially unexplored applications of the same mobile device, originally developed for communication purposes. For example, consumers are found to use cell phones as a source of light, as toys for children to play with, listening to music, and many more (Thumbplay 2008).
Offering government services, electronically (e-Government) involves the design and development of citizen-centric information systems. In the process of designing smart information systems, developing an understanding about information environment and information behavior of the potential clients are some of the crucial steps for collaborating teams of information systems designers and developers. The information gathering, processing, and analyzing phases build a foundation for any successful information system (Donovan 2007). Phenomena of information behaviors such as information poverty and normative behavior have been used to study and alleviate information poverty and digital divide in e-Government (Jaeger and Thompson 2004). Timely and appropriate flow of agriculture related information between policy makers, researchers and farmers via agricultural extension officers have been improving the quality of agricultural products in Nigeria (Aina 1985).

The information behavior also serves as a starting point for many other advanced fields such as knowledge management, innovation strategy and knowledge processing. A study of different organizational information processes in information intensive organizations concludes that the process of building knowledge base in organizations can be studied using information behavior pattern and work processes (Widen-Wulff 2003). Better understanding of information behavior of a team helps in creating interwoven patterns of individual, inter-group and intra group situational awareness among teammates in dynamic contexts (Sonnenwald and Pierce 2000). In dynamic contexts, such as battlefields, bi-directional flow of information for an individual plays a critical role. It enhances team spirit thereby improving performances of the soldiers. Certain soldiers may act as information handlers, useful to create knowledge-base for other soldiers on battlefield. Thus, applications of the information behavior range from consumer research to military
forces including designs of information systems developed as a part of e-Government initiatives.

2.3.1 Emerging Research Sub-areas

*Multitasking information behavior*, one of the emerging sub-areas of information behavior research, studies the concurrent ways of seeking information over a period of time; the main focus is on evolving set of information tasks including changes or shifts in beliefs, cognitive, affective and/or situational states (Spink et al. 2002). The lenses from the field of philosophy gave rise to a new sub-area called *philosophy of information* which focuses on reasoning, rationales and driving factors for information exchange (Herold 2001).

*Collaborative information behavior*, relatively the newest research sub-area under the research umbrella of the information behavior, studies interpersonal information communication, the level of complexity for the information needs in group communication, and the impacts of ICTs (Reddy and Jansen 2008). *Intra-individual information behavior* studies the characterizations of individual’s information behavior across different daily life situations, to seek behavioral patterns that might be associated with various aspects of information-seeking situations (Julien and Michels 2004).

Due to a wide variety of interdisciplinary applications of the field of information behavior, a number of sub-areas for this research field have been explored and developed by the information science research community. All of the above emerging sub-areas in the field are a combination of interdisciplinary applications of information behavior and research contributions from various disciplines beyond LIS. Thus, emerging sub-areas of the field of information behavior reinforce the *interdisciplinary nature* of the field (See Figure 5).
2.4 Information Behavior: A Reinforced Interdisciplinary Evolution

Over a period of seven decades, since the inception of the field of information behavior it has experienced a gradual change of focus from system-centered approach to person-centered approach in research. As a result of the human-centered approach in the field, information environment and information context emerged. Even though fundamental concepts of information behavior are grounded in LIS literature, they are also widely supported and applied by many other fields including but not limited to health research.

![Interdisciplinary Reinforcement Model](image)

Figure 5: Interdisciplinary Reinforcement Model describing Reinforcement of Interdisciplinary Field of Information Behavior

There is a cyclic effect observed in the case of ever evolving field of information behavior research. The field has many interdisciplinary contributions which lead to interdisciplinary applications of the field. These interdisciplinary applications in combination with myriad of interdisciplinary concepts, in turn, lead to emerging sub-areas
in the field. These emerging sub-areas reinforce the interdisciplinary nature of the field of information behavior thereby ushering an interdisciplinary evolution for the field of information behavior.

2.5 Applying Old Theories in a New Context

From the above theoretical exploration of the information behavior field, we can easily infer that the current theories of information behavior used to explain information behavior have been developed primarily in the western context. The theories are informed from data which are primarily grounded the western users. Whereas this dissertation research studies the information behavior of disadvantaged women who use and own cell phones from rural India and the role of cell phones in shaping that information behavior. Dissertation research makes an assumption that the explosive use of mobile technologies by disadvantaged women from rural India must be changing the information behavior of those cell phone users. This information behavior eventually enables those cell phone users to take advantage of various socio-economic opportunities generated due to cell phones. Thus this dissertation research will apply information behavior theories developed in the Western context to study the information behavior of cell phone users in the context of developing nations (See Figure 6).

When theories and their predictions are used in contexts other than the one in which they were originally developed, they are confronted with "alien" conditions that could severely test the limits of these theories and their applicability (Kumar et al. 1998).
To the extent to which a theory survives such a test, it is considered "robust." From such confrontations and tests, there sometimes arises a need for a re-examination of the premises underlying the theory; this, in turn, could lead to a reformulation or extension of the theory, and occasionally even its rejection and replacement (Kumar et al. 1998).

The theoretical exploration of the field of information behavior, using the Model as a navigating tool, surfaces a very small number of studies with limited focus on “impacts of ICTs on developing nations.” The literature body associated with information behavior seems to have a low degree of robustness in the context of developing nations and emerging ICTs. By studying the role of cell phones in shaping the information behavior of disadvantaged women from rural India, this dissertation fills in this gap between what is known about the utility of these theories in the developing versus the developed context. Also, the findings about the role of cell phones in shaping information behavior of disadvantaged women from rural India enrich the existing knowledge about impacts of ICTs on information behavior.
Chapter 3

Research Design

Research design is shaped by the constraints offered by the research context and research problems (Tashakorri and Teddlie 1998). This dissertation explored the linkage between the information behavior of a disadvantaged population from a developing nation and the role of cell phones in shaping that information behavior. Given the limited resources available to a doctoral student, it was practically not feasible to locate and reach disadvantaged populations from developing nations. Hence, it became necessary to apply stratified sampling technique to locate a sample representing disadvantaged population engaged in a set of common activities, when using cell phones (Fowler 1993).

Recent research studies on women conclude that education (Font et al. 2006, Kumar et al. 2006, Zutphen et al. 2008), age (Arber 2004, Raymond 2007), and marital status (Arber 2004, Miller and Porter 2007) significantly influence socio-economic status and information behavior of women compared to men in similar contexts. Age plays a key role in creating socio-economic inequalities more among women than compared to men (Gnavi et al. 2008). Age also emerges as the most significant factor in influencing information awareness level among women (Khang et al. 2008). For dropout women (i.e. women who discontinue their education without completing degrees from their academic institutions), children and family create a major barrier in their socio-economic stabilization, when compared to men with similar poor educational backgrounds (Miller and Porter 2007). Single women from developing nations face more barriers to access to various social services (for example, health care) compared to married women (Al-Adili et al. 2008). The above set of findings guided the research design for the dissertation research.
Since this dissertation aimed to explore the linkage between cell phones and disadvantaged women from a rural part of India, age, education, and marital status were expected to influence women’s information behavior with its implications on their socio-economic status. The study also compared the information behavior of disadvantaged women, which could be categorized based upon their age, education, or marital status. A number of quantifiable demographic factors including age, education, were collected from a sample of disadvantaged women. After identifying 2 groups of disadvantaged women based on their distinct information behavior, it was required to interview them in their native language, for in-depth understanding of their information behavior.

Quantitative and qualitative data collected for this dissertation brought complementary views on the same research problem. This type of research design is known as Mixed Methods (Creswell et al. 2003) research design. Researchers from the field of information behavior emphasize person-centered approach of qualitative investigation (Chatman 1992, Dervin 1976). The combination of quantitative data collection phase with qualitative inquiry retained a person-centered approach to the investigation.

The first section of this chapter offers a set of rationales for choosing India as the research context. The second section delineates the process of defining a sample through a stratified purposive sampling technique, and the third section extends demographic and geographical details of Bhor, which is the research location. The fourth section entails primary sources of income for disadvantaged women. The fifth section provides a set of rationales and implementation details of Sequential Explanatory Mixed Methods research design. The sixth section relates constructs from the Model to the data collection process; the section also reveals features and background work required to collect data in both quantitative and qualitative formats. The seventh section maps qualitative and quantitative
data onto various constructs from the Model. The eighth section enlists proposed major independent and dependent variables. Finally the last section is dedicated to discussing strengths and weaknesses of the study, including data collection methods.

3.1 Setting Research Design in an Appropriate Context

Income, health, and education are some of the most widely used criteria to measure the degree of disadvantagedness of a human being (Bourguignon and Chakravarty 2003). In order to develop a focused research design, income based criterion of economic disadvantagedness was chosen for identifying disadvantaged population. India has the world’s largest number of people under the poverty line (defined and explained below) in a single country (IndiaOneStop 2008). Hence, the research study was conducted in India.

The Indian Government’s Ministry of Statistics and Program Implementation defines the poverty-line based upon a norm of money required for a minimum nutritional level – 2400 calories per capita per day for rural areas and 2100 per capita per day for urban areas (MSPI 2008). While assessing the economic poverty, the Indian Government does not take into account the amount of money a person is capable of spending on food; instead it measures the total amount of money earned by an individual per day (D’Souza 2006). The Indian Government defines the poverty-line as $6.78/month for urban population and $6.32/month for rural population with a cut-off based upon calorific value (Writer 2007). The research design considered the contemporary definition of the poverty-line defined by the World Bank - $1/day/person - for selecting a sample of disadvantaged women (World Bank 2008).

3.2 Sampling Technique

A stratified purposive sampling technique was exercised to locate, identify, and collect data from a sample of disadvantaged women. The term *stratified* is used because the
research identified a sample by applying strata, i.e. filter. Each stratum acted like a filter, creating better focus in selecting disadvantaged women from rural India (See Figure 7 below).

- **Filter 1: A Developing Nation**
  - India: Nation with the highest number of citizens living under the poverty-line defined by the Government of India

- **Filter 2: Rural**
  - Citizens from rural India have less exposure to socio-economic opportunities compared to the one from urban India
  - Three of every four poor people in developing countries live in rural areas, i.e. 2.1 billion living on less than $2 a day, and 880 million on less than $1 a day (World Bank 2008).

- **Filter 3: Caste**
  - “Backward Class”: The term was coined and defined by the Indian National Commission on Backward Classes, Government of India, for identifying population segment marginalized from education and socio-economic perspectives, in the rigid, hierarchical social structure of India (National Commission for Backward Classes 2005).

- **Filter 4: Daily Income**
  - Less than $1 (Poverty cut-off defined by the World Bank) (World Bank 2008)

- **Filter 5: Gender**
  - Female: Traditionally, India is a male-dominated society; hence, female are more disadvantaged compared to male (Mehta and Shah 2002). Moreover, women are often found to internalize the belief that men are superior to women, when it comes to handling technologies (Wajcman 1991). Moreover, social scientists have already proven that computers are assimilated into the masculine cultural system very easily (Wajcman 1991).

- **Filter 6: ICT Users**
  - Cell phone owners and users (See Section 1.2.1 for the explanation)
Figure 7: A Stratified Purposive Sampling with 6 Filters (Strata)

Out of India’s nearly 1.1 billion inhabitants, an estimated 400-450 million are below the poverty-line with 74.3% of them living in rural India. More than 40% of the total population in India is illiterate, and women from the backward class are adversely affected (Mehta and Shah 2002, IndiaOneStop 2008). The Indian society has a very rigid and structured social hierarchy, also known as Caste System. Hence, even in the 21st Century, this traditionally defined rigid and structured hierarchy is practiced in many parts of the country.

On January 29, 1953, for the first time after nation’s independence, the Central Government of India appointed an All India Backward Class Commission to safeguard the interests of backward classes. The commission revealed a list of 2,399 backward castes/communities for the entire country and 837 of those were classified as “most backward” (National Commission for Backward Classes 2005). The Government of India
further segmented backward castes into scheduled castes (SC), scheduled tribes (ST) and other backward classes (OBC).

According to the National Commission for Backward Classes Act, 1993 (NCBC Act 1993),

“Backward Classes” means such backward classes of citizens other than the Scheduled Castes and the Scheduled Tribes as may be specified by the Central Government in the lists.

Until 2004, 2052 casts/communities from all over India were included as a part of OBC (National Commission for Backward Classes 2005). The Central Government of India introduced a national reservation for such backward classes/communities based upon 11 criteria or indicators proposed by the Second All India Backward Classes Commission, popularly known as Mandal Aayog (National Commission for Backward Classes 2005). Those 11 criteria or indicators to identify and categorize the backward classes or communities were based upon social, educational, and economic status of castes or communities (National Commission for Backward Classes 2005). In a male-dominated Indian society, among any financially disadvantaged rural communities, women seem to be oppressed more than men. Hence, for the dissertation research, backward class women who earn less than $1 per day, located in Bhor from rural India (See Figure 8) represented one of the most disadvantaged populations from a developing nation.

3.3 Bhor, India: The Context for this Dissertation Research

Bhor, a typical village in the western state of Maharashtra offered a typical rural context for studying the information behavior of a sample population from rural India. The village is located at 18.17° North (latitude) and 73.85° East (longitude) with an average
elevation of 588 meters above the sea level. Bhor was one of the princely states of British India. According to the latest census conducted in 2001 by the Government of India, it had a population of 17,882. Males constitute 51% of the population and females 49%. Bhor has an average literacy rate of 78% which is higher than the national average of 59.5%. Bhor has a male literacy rate of 83% and female literacy rate of 73% (PMC 2008).

Figure 8: Geographical Location of Bhor, State: Maharashtra, India

3.4 Details about a Sample of Disadvantaged Women

After locating the research context in rural India, the next step was to identify the actual number of backward class women with daily income less than $1, who own and use
cell phones. Sampling selection procedure offers an opportunity for some individuals to be a part of the sample and exclude others (Fowler 1993). MGU, a domestic, small-scale business in Bhor, India, was identified as a research site to locate a set of financially disadvantaged backward class women who carry out some common activities which enable them to be sampled.

From January through May of every year, MGU fulfills all the orders of traditional Indian snacks that can be stored for whole year; hence that is the only window of opportunity for employees to work at MGU. During that period MGU prepares traditional Indian snacks for the whole year, but since many of preparations require drying of snacks in bright sunshine, traditionally those snacks can be prepared only till May, the last month of summer. In addition, MGU does not have any advanced equipments to replace drying of traditional snacks in bright sunshine, or even store them in cool and dry storage rooms. When inquired, MGU authorities conveyed that they do not have enough capital to invest into expensive dryers and storage rooms required for their business. From June onwards monsoon takes over sunny skies till the end of September. October and November have a series of Hindu festivals which makes it difficult for MGU authorities to get women employees. In December, MGU authorities typically start receiving orders and advance payments, for the whole year from restaurants, marriage halls, and hotels, etc. from nearby areas.

Backward class women who owned and used cell phones and earn less than $1 per day, by working at MGU represented a sample population which was studied for their information behavior shaped by cell phones. On the condition of protecting the privacy of women employees and restricting the application of data strictly for the research purposes,
owners and managers of MGU agreed upon identifying backward class, cell phone holding women employees who had a daily income less than $1. Out of 380 women employees who were registered for working at MGU, there were 121 backward class women employees who owned cell phones and have been paying their cell phone bills on their own. Thus, 121 was the size of a sample for studying the information behavior of a disadvantaged population which owned and used cell phones.

3.4.1 Business Process at MGU

The description of business process at MGU will help readers to understand the value, utility, and possible applications of cell phones in the lives of a sample population which was employed at this domestic business. MGU produces a wide range of traditional Indian snack items such as papad (a snack item similar to thin and flat bread), pickles, and sweetmeats. There are five permanent employees who take care of logistics such as buying cereals from the market, mixing various spices with dough prepared from a combination of cereals, and then labeling and packaging of products. In addition, there are around 380 poor and needy women from the surrounding areas, who had been offered employment of some sort, since the inception of MGU. Daily wages remain dependent on the number of items women prepare and number of hours they work.

Women employed on the daily basis are required to register on the previous day, by 7 p.m., if they wish to work on the next day at MGU. This helps MGU to estimate and arrange raw supplies for the next day’s working schedule. For employees who own and use cell phones, this mandatory communication with MGU management on the previous day becomes very easy. Cell phones cut down on the effort and time required by women employees, to physically visit MGU and confirm their interest for the next day’s work. With
a single call, women, especially those who live in the radius of 1 mile to 10 miles from the MGU business site, can reserve and/or confirm their assignment for the next day.

Employees bring their own cooking tools such as polpat (a heavy flat metallic surface) and latane (a light weight ellipsoidal wooden stick) on the work. Traditionally, the kitchen is supposed to be managed by women; hence MGU employees feel very comfortable engaging themselves in cooking activities in a group setting. Generally, women sit in a round and do their assigned duties for the day, while chatting with each other.

Typically, in India, teen-aged girls are explicitly trained traditional ways of cooking for their future in-laws (Desai 1996). Since traditional recipes of preparing snacks, pickles, and sweetmeats are followed at MGU, there is an easy learning curve for them to work at MGU. For example, fixed amount of readymade dough (typically 3 kilograms) with all required ingredients added to it, is directly handed over to the employees. All they have to do is to make approximate number of papads from assigned dough.

There are two time slots, also known as shifts, in which women employees prepare traditional food items. The first shift lasts from 8:00 a.m. through 12:00 p.m., whereas the second shift runs from 1:00 p.m. to 5:00 p.m. To work in the first shift, typically, women from the vicinity gather early in the morning at around 7:45 a.m. in the MGU’s premises and by 8:00 a.m. all of them are assigned raw items. Those who wish to work part-time for the day leave by 12:00 pm. There is a lunch break for one hour and the second shift begins at 1:00 p.m. A fresh batch of women employees for the day and a fraction of the first shift employees continue their assignments till 5:00 p.m. At the end of the day, all employees are offered daily wages in return for their work. Typically, an employee earns Rupees 30 ($0.75) to Rupees 45 ($1), depending on her assignments and output product items.
3.5 Sequential Explanatory Mixed Methods Research Design

This dissertation study implemented a sequential explanatory mixed methods research design, which is usually made up of two distinct sequential phases – quantitative and qualitative (Creswell et al. 2003, Ivankova et al. 2006, Tashakorri and Teddlie 1998). Data collected in the first phase are then examined using various analytical techniques depending upon needs of the research design. Data captured in the second phase are expected to explain and elaborate results from the first phase; hence, the type of mixed methods research design is known as *sequential explanatory design* (Creswell et al. 2003, Tashakorri and Teddlie 1998).

3.5.1 Why is Sequential Explanatory Mixed Methods Research Design considered?

Findings from quantitative data collected in the first phase were executed to lay foundation for selecting participants to collect qualitative data in the second phase. The incorporation of qualitative data with quantitative data developed more defensible knowledge claims with stronger validity and credibility with less known bias in the study. As expected, qualitative data collected in the second phase provided stronger evidence of results and conclusions from the analysis of quantitative data from the first phase (Greene et al. 1989). This increased insight and understanding of causality and relationships among various constructs identified and operationalized from the Model. The Data Planning table summarizes [See Appendix B] operationalized constructs from the Model. As a result of this operationalization, each construct from the Model gave rise to a number of variables [See Appendix C]. Five constructs from the Model led to 33 variables. More details on processing of data collected in both formats are given in sections 3.7.1 and 3.7.2.
3.5.2 Implementation Details of Sequential Exploratory Mixed Methods Research Design

The first phase of this sequential mixed methods research design consisted of designing, distributing, and collecting surveys to collect a quantitative dataset. Locating the sample population, deciding upon sampling techniques, designing survey instruments, calculating response rate, collecting data, and analyzing survey data are the key steps and aspects of any survey design (Fowler 1993). The following sub-sections address all of these steps and related issues in detail. In the first phase of data collection, responses through group-administered surveys (See Figure 9 below) generated a set of quantitative data such as numbers, responses in a single word, and yes/no type responses. All the yes/no type responses and responses in a single word were later encoded into frequency distributions. This eventually facilitated the quantitative analysis of data from the first phase.

For maximum turn-out in the surveys, announcements related to the surveys, including incentives and rights of respondents, were broadcasted 7 days in advance. Husbands of five did not allow them to participate in these surveys. In addition, family members of 10 illiterate employees prohibited them by filling in these surveys. After terrorist attacks on Mumbai, India, in November 2008, approximately a month before distributing surveys in Bhor, Indian investigation agencies found out the fatal role of cell phones in those events; and the news were being consistently delivered by media in all parts of India. Hence, children of 4 employees thought that the surveys were part of Indian intelligence agency’s initiatives to gather more information from rural areas. Hence, those 4 women opted out of the surveys. Those who excluded themselves did so, mainly, because of the family pressure.
Phase I: Quantitative

QUANTITATIVE DATA COLLECTION
1. It took about 15 minutes to fill in group-administered surveys
2. Sample Size: 121 women
3. Manager at MGU administered the surveys & filled in details for illiterate women

QUANTITATIVE DATA ANALYSIS
Located Distinct Patterns in Quantified Data

Observations based on Quantitative Data

Phase II: Qualitative

QUALITATIVE DATA COLLECTION
1. Phone Interviews in Marathi
2. About 30 minutes long
3. Open-ended Questions

QUALITATIVE DATA ANALYSIS
1. Content Analysis
2. Conceptual Analysis and Relational Analysis
3. Using Qualitative Data Analysis S/w

SELECTION of PARTICIPANTS
FOR PHASE II (Groups based on “Marital Status”)

Group 1: 12 Women married for more than 20 years
Group 2: 10 Unmarried girls

FINDINGS

Figure 9: Sequential Explanatory Mixed Methods Research Design
(Adapted from Creswell et al. 2007)
In spite of having the assistance of the research administrator (RA) at MGU, out of 102 respondents, two respondents did not complete the surveys. The results of the first phase exhibited patterns in the information behavior of 100 women respondents. The patterns were observed due to differences in the marital status of respondents (See Figure 9 above). Thirty MW and 13 UMG emerged as two groups with distinct information behavior related to owning and using cell phones.

Depending upon the availability and willingness of members from MW and UMG, 12 MW and 10 UMG were interviewed in the second phase of data collection to study their information behavior in-depth, and the role of cell phones shaping their information behavior with its implications on socio-economic opportunities. Phone interviews with selected participants produced rich qualitative data.

The qualitative data and their analysis, carried out in the second phase, explained patterns observed in the quantitative data from the first phase. Conceptual content analysis was run with the help of Concordance (version 3.2), analyzing the corpus of interview data which was translated from Marathi to English. Thus second phase explored the information behavior of a sample population from the lens of the Model in maximum possible depth.

3.5.2.1 Response Rate for the Sample

As mentioned earlier, MGU management had already announced about the surveys as an opportunity to earn US $0.25, a lucrative incentive in return. Earning almost half the amount of daily wages just for filling out the answers for interview questions in 10-15 minutes attracted a majority of the women employees of MGU. Out of 121 potential women employees, 102 women filled in group-administered surveys at MGU; thus the response rate for the first phase of data collection was 84.29% (102/121).
3.6 Data Collection

Group-administered surveys were distributed to only those women who agreed to participate in this exercise, after reading the consent form [See Appendix D] designed for surveys. After distributing consent forms to all the present employees, approximately 15 minutes were allotted for reading and understanding the consent form. The RA clarified all questions asked by respondents. This group-administered survey consisted of 7 questions capturing demographic features such as name, age, address, occupation, education, income and marital status of respondents, and 22 questions informing constructs from the Model. Group-administered surveys questions [See Appendix E] gathered information on the variables which were offshoots of constructs from the Model.

Since women employees at MGU work in group settings, with the permission and assistance of MGU management, questionnaires were distributed in group settings. Studies show that respondents feel more comfortable in answering general questions in a group, which creates high response rate with high quality (Fowler 1993). The survey questionnaire was designed in such a way that it would take approximately 15 minutes to fill-in all the answers. These answers directly mapped on to various variables [See Appendix C] derived from constructs of the Model during the operationalization process.

3.6.1 Training for Conducting Surveys

The sponsor from MGU was appointed as the RA to facilitate the fieldwork in Bhor. This strategy of appointing a local woman who communicates in the respondents’ mother-tongue and whom they meet on a regular basis worked to the dissertation’s advantage. The RA could easily convey and convince MGU employees for participating in the surveys. The researcher and his RA, both, cleared the State University of New York’s Institutional Review Board (IRB)’s exam for conducting research on human subjects. The RA was equipped with
information regarding all types of preparatory activities required to carry out group administered surveys and contingency planning to conduct the surveys. The consent forms assisted the RA (a) to offer the central idea of the research to all respondents, (b) to distribute the questionnaire to the respondent, (c) to take precautionary measures to assure the privacy of responses, (d) to allow respondents to quit the surveys anytime they wish, (c) to allot sufficient time to respondents for completing the surveys, (f) to handle the survey responses collected in sealed envelopes carefully, and finally, (g) to deliver the envelopes back to the researcher’s contact in India. The RA responsible for these activities was paid a handsome compensation of $60.

3.6.2 Qualitative Data Collection

As shown in the research design (See Figure 9 above), interview sample of 12 MW and 10 UMG was formed. The RA acted as an interface between the researcher and interviewees for scheduling interviews; issues related to the interview process are summed up in Chapter 5. The consent form [See Appendix F] designed for phone interview was given to each interviewee, and it was mandatory to sign the consent form before the actual interview. The consent form informed all potential participants about all the details related to phone interviews and lucrative compensation of $0.5) for each interviewee. Most of the interviewees were contacted on their own cell phones at their preferred timings. This helped them to answer all the open-ended questions comfortably [See Appendix G]. In India, incoming calls are not billed, thus participants did not end up spending any money, during their conversation with the researcher.
3.6.2.1 Background Work and Features for Qualitative Data Collection

In any qualitative research design, data collection instruments and interview guides are typically informal, flexible, and subject to large variations in application (Mittman 2001). For the purposes of this dissertation, precautions were taken for not losing focus, while collecting qualitative data by designing appropriate data collection and recording instruments. The Interview Guide [See Appendix G] developed for collecting qualitative data was a combination of open-ended questions and prompts. Interview questions directly informed all constructs from the Model. The Data Planning table summarized all the five constructs from the Model, variables operationalized from the constructs, and definitions of all the 33 variables. The Interview Guide and Data Planning table developed a high level of congruence between constructs from the Model and responses from disadvantaged respondents. Responses from women directly mapped onto variables derived from the five constructs of the Model. This enhanced the internal validity of the study.

Audio recording of phone interviews at the interviewer’s end, using Olympus sound recorder increased data validity and completeness by capturing each and every word uttered in conversations of the interviewer with interviewees from rural India. Recording of interviews conducted in Marathi immensely helped in preparing detailed transcripts in English.

3.6.2.2 Marathi: The Language for Data Collection

The use of language is central to interviewing since language can discourage or encourage the flow of conversation (Bates 2004). India is the only nation with 18 official languages and more than 850 dialects. Interviewees used words, expressions, or idioms from Marathi, native language for both interviewees and the researcher, which did not have any corresponding word in English. Many regional, context-dependent linguistic expressions
would have been missed, if interviews were carried out in English. Conducting interviews in respondents’ native language enabled the interviewer to extract information about vernacular norms of behavior. Many native expressions, adages, regional context, local references, and current developments helped to capture attitudes, perceptions, feelings, and thoughts of interviewees effectively.

3.6.2.3 Features of Interviews

The researcher faced problems caused by technology as well as human beings, while conducting interviews, which are described in Chapter 7. Due to such obstacles no interview lasted for 30 minutes, as expected in the original research design. The shortest interview was for 9 minutes and 7 seconds (from MW) and the longest interview was of 24 minutes and 22 seconds (from UMG). The average duration of interview with MW was 14 minutes and 32 seconds, whereas with UMG, it was 16 minutes and 25 seconds. Many a times, UMG respondents used a lot of English words such as mobile, phone, calls, number, office, class, college, friends, job, bus, meeting, madam, sir, and landline. In contrast, MW respondents did not use many English words except phone, mobile, and landline. Interviewees were triggered, excited, and/or engaged in conversations by a variety of open-ended questions. For the precision in translation into English, interviewees were often asked to clarify what they really meant, especially when they made any strong statements and/or expressed their concerns or opinions with regard to owning and using cell phones. The analysis of data went in tandem with data collection, i.e., interview transcripts in English were analyzed right after each interview.

3.6.2.4 Translation of Interviews from Marathi into English

The conversion of verbal interactions that took place in one language between the researcher and interviewees, into textual form in another language, and then making the text
available to multiple readers in multiple formats is a multi-layered process (Lambert 1997, Nida 1982). The dissertation consisted of (a) one-to-one communication between the researcher and 22 interviewees, (b) translation of those verbal conversations into English, (c) analysis of the interview transcripts using qualitative data analysis tools and techniques, (d) interpretation of findings, and (e) conclusion for the study. The researcher who interviewed interviewees in their native language, made sure to translate interviews by himself. Since the translation of interviews from Marathi into English reflected the original data in Marathi, but were recreated for an audience which understands English, such translated data assumed the form of “transmuted texts” (Halai 2007).

Every word that people use in telling their stories is a microcosm of their consciousness - (Vygotsky 1987, p. 236)

Many expressions in one language (e.g. Marathi) cannot be translated into another (e.g. English). Sometimes, there are no direct translations of words. Hence, the researcher decided to translate each and every word said by the interviewee for understanding her experience of owning and using cell phones, with reference to contexts in which cell phones have shaped her information behavior with its implications on socio-economic opportunities.

Marathi interviews were directly translated into English, by pausing ongoing audio recording of interviews. The translations also have a shade of decoding “culture of interviewees” and encoding their words into another language (Torop 2002). Experiences of owning and using cell phones were narrated by Marathi interviewees from rural background; those narrations were further translated by the researcher who was born and brought up in an urban context. Although interviewees were often asked by the interviewer to clarify various rural terms they used, the urban-rural gap could have introduced errors in the final
version of translations. For example, despite being from the same state (Maharashtra) and speaking the same mother-tongue, due to the urban-rural divide, the interviewer could not understand the meaning of a word “kosri” used by an interviewee. After asking for the clarification, the interviewee told that kosri is a unit of measuring distance, and one kosri equals to around one kilometer.

Since meanings of words are inherently ambiguous and context-dependent (Dey 1993), in order to reduce bias in the analysis of qualitative data, “intentions of subjects” were interpreted with the process through which responses were collected. Despite having perfectly acceptable Marathi words, their corresponding English words were quite consistently used by interviewees in their responses. Such English words are presented in double quotes in transcripts.

Virkar Dictionary (which is equal to the caliber of Oxford Dictionary) was used for bringing in consistency through a standardized reference in translation. However, for some Marathi words there are no corresponding English words. Hence, such Marathi words were left as they were, with meaning elaborated in square brackets. There are some Marathi words marked by asterisk mark, with meaning explained in square brackets right after the use of those words. Spelling mistakes, punctuations, etc. were double checked. In spite of using Virkar Dictionary as the standard reference for translation, the researcher had to make a lot of choices in selecting English words from the dictionary, expressing appropriate shades of Marathi words. This could have introduced bias in research findings.

Overall, the transformation of Marathi interviews into English text was a tedious, time-consuming process. Many interviewees told fantastic stories and experiences during their open-ended responses, illuminating the context of their information needs, their
information-seeking behavior, and their ability to process and use information acquired through their cell phones. Despite researcher’s extra efforts to capture precise connotations of Marathi words, there is a possibility that the richness of rural Maharashtrian context might not have reflected in certain instances.

3.7 Data Analysis

As explained earlier, Data Planning table [See Appendix B] summarizes the operationalization of five constructs from the Model. The operationalization led to 33 independent variables [See Appendix C]. The survey questionnaire designed for the first phase generated quantitative data; whereas in the second phase, interview questionnaire with prompts generated in-depth qualitative data, fetching data for all constructs from the Model. Data in both formats were analyzed sequentially in two distinct phases, namely quantitative data analysis and qualitative data analysis.

3.7.1 Quantitative Data Analysis

In the first phase, quantitative data were analyzed for detecting trends or patterns in the information behavior of respondents. Quantitative data revealed various patterns, distributions, and correlations in the information behavior, cell phone usage related quantifiable features, and demographic features.

3.7.2 Qualitative Data Analysis

Due to the memory sensitive nature of collected data through interviews, Mittman’s (2001) advice was followed to carry out post-collection coding and review of data immediately. Audio recording of in-depth interviews at the interviewer’s end helped to reduce the errors that could have been introduced, if relied on the interviewer’s memory for data. Transcripts of interviews in English formed the corpus of qualitative data. With the
help of Concordance (version 3.2), this corpus was processed using Content Analysis. Content Analysis consisted of conceptual analysis and relational analysis. Qualitative data analysis software was used to store and maintain data, terms, properties, concepts, and relations among them.

3.7.2.1 Conceptual Content Analysis

Content Analysis is a qualitative data analysis technique which transforms and analyzes communication content or messages through the systematic application of constructs (Kassarjian 1977). It is a standardized, objective analysis of messages (Neuendorf 2001). It relies on the categorization of rules, also known as codes, which are clustered around constructs of any theoretical framework. Typically, such codes are developed either manually (known as human coding), or with the help of technology (known as software coding). Frequency count of codes keeps track of occurrences of codes in a given message or communication content to be analyzed. Inferences are drawn from identifying specified codes in text, message or communication content (Stone et al. 1966). The greater the replicability of codes representing a particular theme or a construct, the higher is the validity associated with inferences that are derived from that Content Analysis (Krippendorff 2004).

Qualitative data collected in the second phase of this dissertation research was analyzed using theory-driven coding (Neuendorf 2001). Human coding [See Appendix H, Appendix I and Appendix J] was performed with reference to the Model. Codes were built manually using Wilson’s (1997) elaborated framework on information behavior. Information behavior of 12 MW and 10 UMG was studied in detail, mainly, to understand the context of information needs, information-seeking behavior, and information processing and use, with their implications on socio-economic opportunities (See Figure 10).
3.7.2.1.1 Precautions for Coding

Many precautions were taken, while manually devising codes, for capturing the precise meaning of actions in the rural Maharashtrian context. For instance, feeling and realizing are some of the most common ways in which needs are experienced. Hence, while coding for sub-construct such as subjective needs (ways in which information needs are realized), different forms of verbs such as “feel*”, “felt”, “realize*” were used. Asterisk mark was used to filter all the combinations after the mark in those words.

The combinations of concepts, for example, “I” and “Need” were used to identify needs realized or experienced specifically by any interviewee. While coding for unlearned motives for owning and using cell phones, it was made sure to design codes that capture human feelings such as eager, attraction, and curiosity. Codes for unlearned motives covered different forms of such feelings that commonly spur in us, without doing anything intentionally.
Codes for social motives covered names for most of the human relations encountered in everyday life, while owning and using cell phone [See Appendix H]. Codes for social motives also listed different forms of verbs such as chat, discuss, talk, connect, and contact. The theoretical foundation for affective needs focuses on needs that are affected by a phenomenon to be studied. For dissertation study, the phenomenon was “ownership and usage of cell phones”. Codes for affective needs mainly captured socio-economic needs that are often affected by owning and using cell phones. Hence, codes related to employment, job, work, income, and financial earning were considered for affective needs.

Wilson (1997) describes theoretical base for cognitive needs as the use of information and/or knowledge for self-satisfaction; hence, codes for cognitive needs consisted of different forms of information and knowledge, and their applications for cognitive satisfaction in everyday life. Codes were designed to filter in different forms of information and/or knowledge that are typically applied for achieving mental satisfaction and pleasure. Codes such as fun, entertain*, pleasure, and spiritual* were used for this category.

Codes for information processing and use addressed both human and technological barriers for processing and using information acquired via cell phones [See Appendix I]. Human barriers took into consideration elements such as risks, dangers, restrictions, and discouragement. Codes for technical barriers were comprised of various forms of the following words: electricity, charging problems, range, and signal strength.

Overarching terms such as call, mobile, cell, and phone were avoided as codes. Concepts such as “use” and “call” were not considered, since they could have been misleading in terms of inferring anything concrete about the information behavior of interviewees. However, combinations of the concepts, with nouns were used to detect
relations among concepts. Code for “decision” was avoided since the person who took the decision for a woman determines whether it is active or passive element of information-seeking. However, various combinations of the code with “I”, “they”, and “we” were considered to distinguish between active and passive voice.

### 3.7.2.2 Relational Content Analysis

Relational Content Analysis (RCA), also known as Semantic Analysis, is carried out for detecting semantic or meaningful relationships among concepts or codes (Palmquist et al. 1997). For dissertation research, RCA proved to be an absolutely essential technique, while analyzing information-seeking behavior of interviewees. For example, as depicted in Figure 10 above, information-seeking behavior construct from the Model has active and passive elements for searching information. Identification of concepts on “searching information” was not enough for uncovering interviewees’ active or passive involvement in information-seeking using cell phones. Combination of concepts on information searching such as call, make call*, with the first-person nouns such as “I” and “We” yielded frequencies for active information-seeking behavior [See Appendix J]. Combinations of concepts such as “call”, “tell”, and “make call*” with the third-person nouns such as “they”, “she”, and “he” filtered passive information-seeking behavior frequencies. Similarly, combinations of “they” “talk*” “to” and “me”, “they” and “decide*”, and finally, “taught” and “me” were used to distill frequencies of passive elements in information-seeking behavior.

RCA immensely helped in clarifying relations among various concepts as well as directions of their relationships. For example, concept such as “after” was clubbed individually with “buying” and “mobile” to verify whether the actual action of buying cell
phones occurred as a result of interviewees’ decision, or someone else made a decision on their behalf.

To verify interviewees’ active role in owning cell phone, the relationship among “I” “bought”, and “mobile” was checked; in another instance, combinations of “my” and “choice”, and “my” and “decision” were also scrutinized to confirm women’s desire for active search of information. For example, in the following excerpt of an interview transcript, active role of the third MW can be seen in buying her cell phone.

We had a landline, and soon after my children were employed they started using mobiles. But they used to call me on our landline, which increased our bill for landline enormously. Hence, I decided to use mobile. - MW-3

RCA also helped in studying strength of relations between concepts. For example, the combination of “great” was checked with “convenience” and “benefit” for gauging the degree of convenience and benefit enjoyed by women, while owning and using cell phone. For example, the following piece of transcript demonstrates the utility of cell phone in enhancing socio-economic opportunities for the eleventh MW:

Earlier, I had to visit my customers for selling papads*[traditional Indian snack], but now due to mobile, they inform me (on my mobile) that we are going to come to your place on so and so date and time. They ask me to keep goods ready, so that they could come and pick them up. I keep their goods packed. Thus, now my customers could pick up goods even in my absence. This is a great benefit of mobile. Now, I don't need to keep waiting for them (customers), I can just pack their goods and leave home whenever I wish. - MW-11
RCA also played a key role in interpreting the meaning of a specific concept in an appropriate context. For example, “status” could be financial, social, or political. While coding for social motives, combination of concepts such as “social” and “status” was used to study the context of relationships between concepts.

3.7.2.3 Software-aided Content Analysis

Concordance (version 3.2) facilitated the whole process of clustering manually developed codes, storing those codes, finding relations among codes, and counting occurrences and groups of codes. Codes were developed manually based on the definitions and descriptions of constructs from the Model. For example, context of information needs construct has two sub-constructs, namely “Need as a subjective experience – ways in which need is realized” and “Types of Information Needs based on Motives”. The latter sub-construct is further divided into unlearned motives, social motives, physiological motives, affective needs and cognitive needs.

Pick-list feature from Concordance was used as dictionaries to store codes. Total 12 Pick-lists were designed, clustering codes for studying the information behavior of disadvantaged interviewees. In particular, 6 Pick-lists for context of information needs, 4 for information-seeking behavior, and 2 for information processing and use were developed. Make Fast Concordance feature from the software was applied for measuring frequencies of codes that were embedded in Pick-lists. RCA was carried out using collocations feature from Concordance. Words in the first, second, and third positions from left as well as right of any code to be analyzed were kept track of. Collocations feature was particularly useful for counting frequencies of codes designed for information-seeking behavior construct.
3.8 Proposed Variables

The operationalization process of five constructs from the Model gave rise to 33 variables [See Appendix C]. The questionnaire designed for surveys [See Appendix E] and interview design questions with prompts developed for in-depth interviews with respondents [See Appendix G] fetched data for all variables. The set of variables whose values are derived from five constructs of the Model are known as dependent variables. The variables whose values are not dependent or determined by any other variables are labeled as independent variables.

3.8.1 Independent Variables

Appendix E enlists the survey questions which led to generating quantifiable data. The questions from the survey questionnaire were designed in such a way that quantifiable data values generated as a result of surveys could be directly stored under a set of independent variables (See Table 1). These independent variables can further be categorized into two categories. The first category consisted of demographic variables such as name, age on the last birthday, complete address, the highest grade exam that a respondent passed, main occupation, whether a respondent is married and finally, and income in Rupees.

The second category of independent variables (See Table 1) consisted of variables generated by the operationalization constructs from the Model. These independent variables held quantitative data that revealed details about the encouragement or discouragement experienced by women.

The independent variables that were mapped directly on constructs from the Model were as follows:
<table>
<thead>
<tr>
<th>#</th>
<th>Categories</th>
<th>Independent Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Demographic</td>
<td>Name, Age, Complete Address, Main Occupation, Education, Marital Status and Daily Income</td>
</tr>
<tr>
<td>2</td>
<td>Activating Mechanisms*</td>
<td>Level of Stress, Duration of using cell phone, Current level of discomfort for using cell phone, Level of Self-efficacy</td>
</tr>
<tr>
<td>3</td>
<td>Intervening Variables*</td>
<td>Level of Proficiency, Connection with being youth, Gender influence, Mode of Information, Language on mobile, Language as a barrier, % of everyday-life information from mobile communication, level of publicity, % of income spent on mobile expenses, and number of minutes spent in mobile communication</td>
</tr>
</tbody>
</table>

Table 1: Three Categories of Variables for Data Collection and Analysis

* Variables Generated from the Operationalization of Constructs from the Revised General Model of Information Behavior.

whether a respondent realized on his/her own for acquiring or seeking information through cell phones, the level of stress experienced when commencing on using cell phones for the first time, duration of using cell phones in months, current level of discomfort for using cell phones, level of proficiency achieved for using cell phones, self-efficacy rating for seeking information through cell phones, degree of influence of age on the level of access to everyday-life information through cell phones, level of usage of cell phones by women compared to men, expected level of improvement in the quality of everyday-life information achieved through cell phones due to living in urban areas, different modes of communication (voice versus data) through cell phones, type of language used (English, Marathi, or Hindi) for a display on cell phones, whether language used for a display on a cell phone forms a barrier, percentage of everyday life information acquired or sought using cell
phones, degree of marketing and publicity for cell phones that affected user’s decision to seek information through cell phones, percentage of monthly income spent on cell phones, and number of minutes spent on acquiring and seeking information through cell phones.

3.8.2 Dependent Variable

The level of information behavior shaped by cell phones was determined by all of the above independent variables generated as the result of the operationalization of constructs from the Model.

3.9 Strengths of the Study

Using a stratified purposive sampling technique, the study located one of the most disadvantaged populations from rural India. This enhanced the internal validity of findings which are based upon data collected from a representative sample population. In addition, factors increasing external reliability of the study emerge as strength for this study. For instance, approximately, 60% population of India resides in rural settings and 74.3% of poor population lives in rural India; hence, this dissertation research study could be easily replicated in any rural setting (village) in India. Also, unfortunately, the sample population of financially disadvantaged women with daily income less than $1 is abundant in rural India; this makes the study easily generalizable.

3.9.1 Strengths of Data Collection Methods

Precautions and techniques applied for the research study boosted internal validity, i.e. credibility of the study. High level of congruence between concepts and observations was insured by designing an instrument that has one-to-one mapping of constructs from the Model and interview questions. Interviews conducted in Marathi helped to cover local norms, beliefs, expressions, and idioms that could not be directly expressed in English.
Audio recording of interviews and immediate coding of interviews also increased internal validity. The Data Planning table and instrument guide helped to store, manage, and retrieve data efficiently, providing effective data management.

3.10 Limitations of the Study

Data for research study were collected from a set of disadvantaged women who had started using cell phones at different points in time. This variation in time period for owning and using cell phones could hinder the reliability of findings. Factors lowering external validity, i.e. transferability of the study, form a set of limitations of the study. Possible factors that could lower external validity are literacy and education level, religion and region (geography). India is a secular nation with various religions Hindu, Muslim, Christian, Sikh, and many others practiced by citizens. Various religions hold different belief systems about women’s education, literacy, and use of technology. Bhor being a heavily Hindu populated village, the dissertation included women from Hindu religion. For other religions such as Islam, results might differ, lowering the external validity of the study.

Geography of a region plays a significant role in setting up the context in which information needs are realized, pursued, and satisfied. India is a country with desert in the West, intermittently scattered deep woods, wide spanning seashores on the West, South and East, Himalayas in the North, and a number of rivers. Financially disadvantaged women from drought prone region economies may have different information needs, contexts to search, seek and gather information, when compared to regions with forest-based economies. On the same line, rural versus urban sample populations might exhibit different information behavior with varied implications on socio-economic opportunities opened up to them due to cell phones.
In India, socio-economic and political differences vary greatly countrywide. On the socio-economic scale, Bihar is relatively backward state with high oppression rates for women and very low literacy rate; whereas Kerala, one of the Indian states practicing the matriarchal system, has literacy rate above 95%. On the other side, Maharashtra, Punjab, and Gujarat are heavily industrialized states with some of the highest gross domestic products (GDPs) in the country. These types of differences between states definitely influence the types of socio-economic opportunities women from backward class are exposed to. This in turn could heavily affect the information behavior shaped by cell phones. Moreover, maturity of the business and types of businesses often shape information needs of disadvantaged women who work there. For example: A five-year old papad business and hereditary but seasonal farming would have quite different types information needs.

3.10.1 Limitations of Data Collection Methods

Data collected in the first phase was through group-administered surveys proctored by the RA. Since RA was an authority at women’s workplace, it is possible that employees could not express themselves clearly and/or they might have felt obligated to participate in the surveys. In the second phase, interviews were carried out on cell phone. The phone calls made by the interviewer located in the US might have created a barrier to engage in conversations with women from rural India, whom the researcher had never met. The foreign location of the male interviewer, and sharing personal experiences of owning and using cell phones with the interviewer who was stranger to the interviewees, might have led to lack of trust and, in turn, might have adversely affected the quality of conversations. The phone conversations might not have helped the interviewer to capture expressions and gestures of interviewees. Moreover, since social settings can never be frozen, it is hard to predict similar findings for the same social settings in the future.
Chapter 4

Marital Status: The Criterion for Distinct Information Behavior

The surveys distributed in the first phase generated quantitative data, answering the secondary set of research questions of this research. Quantitative data also revealed distinct patterns of information behavior, especially, in terms of activating mechanisms and intervening variables for owning and using cell phones. Marital status emerged as the criterion for distinct patterns of information behavior. Responses of UMG and MW differed sharply in terms of the reasons for using cell phones, initial level of confidence, level of self-efficacy, reliance on information received through cell phones, way they perceive the degree of usage of cell phones in urban area versus rural, reliance on data communication using Short Message Service (SMS), types of people they communicate using cell phones, and influence of cell phone-related advertisements on their decision to buy cell phone. This chapter presents demographic information of all the survey respondents and graphical depiction of their responses to key questions. The chapter also highlights difference and similarities between MW and UMG for their information behavior, while owning and using cell phones in Bhor.

4.1 Demographics of Respondents from MGU, Bhor

At the end of the first phase of data collection, responses from 100 respondents were considered for tracing patterns of their information behavior, while owning and using cell phones. Respondents were requested to provide their demographic information at the beginning of the surveys. Through surveys they were inquired about their complete name, age on their last birthday, complete contact information including address, education level, primary source of income, and marital status.
4.1.1 Age

The minimum age for respondents was 18 years, whereas the oldest respondent was of 52 years old (See Table 2).

<table>
<thead>
<tr>
<th>#</th>
<th>Statistics</th>
<th>Values in</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Minimum Age</td>
<td>18</td>
</tr>
<tr>
<td>2</td>
<td>Mean Age</td>
<td>33</td>
</tr>
<tr>
<td>3</td>
<td>Median Age</td>
<td>32</td>
</tr>
<tr>
<td>4</td>
<td>Maximum Age</td>
<td>52</td>
</tr>
</tbody>
</table>

Table 2: Descriptive Statistics

Number of Respondents: 100

Approximately, 21 women out of 100 were around 28 years (See Figure 11); this largest group of respondents was a combination of unmarried girls as well as married women. When asked about whether women would have used cell phones more, had they been younger, 40% of respondents agreed to it, 21% of them were not sure about it, and 39% of women disagreed with it. Women who were unsure about their opinion on the correlation between age and usage of cell phones were above 32 years and below 46 years.

Figure 11: Histogram Representing the Age Distribution of Respondents
When asked about whether women use cell phones more frequently compared to men, 59% of respondents said that men and women use cell phones equally; 37% of women believed that women use less cell phone compared to men; 2% of women were not sure about their opinion; whereas only 2% of women believed that women use cell phone more frequently than men. On another question, when respondents were asked whether they would have received more information through their cell phones, if they had been living in urban areas, 63% of women agreed to it; 7% of them were not sure about it; and 30% of respondents disagreed with it. No unmarried girl believed that they would have received more information using their cell phones, had they been living in urban areas. All UMG shared their cell phone numbers, when asked about their contact information; in contrast, no married respondent did the same.

4.1.2 Education

There exists a significant level of educational disparity among respondents. Half of them were less than or equal to 10th grade educated (See Figure 12). 7% of them were illiterate, in contrast to 11% of them who had completed either one master’s degree, or two bachelor’s degrees, or a combination of a bachelors degree and a certification course.

![Education Level Chart]

Figure 12: Educational Distribution of 100 Respondents from MGU
When asked about whether women have experienced any increment in their knowledge due to information gathered or received via cell phones, 26% of women strongly agreed with it, 65% of them agreed with it, 5% of them were not sure about it, and 4% of them denied the possibility completely. All women who were “not sure” were from MW. Women who completely denied the possibility of increment in knowledge also belonged to MW. All UMG strongly agreed with the utility of information received or gained through cell phones for enhancing their knowledge levels.

4.1.3 Marital Status

Unmarried girls, married women, and widow were three categories for marital status. In the following graph, N/A category represents unmarried girls, “A” through “I” indicate married women, and “J” shows a widow (See Figure 13).

![Figure 13: Marital Status of Respondents from MGU](image)

4.2 Realization of the Value of Owning and Using Cell phones

Three quarters of the total participants realized on their own the utilitarian value of cell phone, and hence, they bought and started using cell phone. For the remaining, husband
their husband played a major role in making them realize about the need of owning and using cell phone. Children and female friends at work were secondary players in initiating the process of making women realize the significance of cell phone in their lives. All UMG reported realizing the need of owning and using cell phones. Interestingly, in a typical rural context of Bhor with very closely knit society, not even a single woman reported neighbors as a set of people who made women realized the need of owning and using cell phones.

4.3 How confident were they when they started using cell phone for the first time?

When asked about the level of confidence experienced by respondents, when they first started owning and using cell phones, MW indicated that they had a very low confidence level – in the range of 0 to 2 – with 0 as the lowest level of confidence (See Figure 14). In contrast, UMG had a very high confidence level – in the range of 8 to 10 – with 10 as the highest level of confidence. The third group (G-3 with 57% of respondents) exhibited a mixed pattern of initial confidence level.

Figure 14: Confidence Level of Women for Using Cell phone for the First Time
In support, it was also discovered that 46% of women were tensed, which included 100% of women from MW. Almost a quarter of participants were not tensed at all, when they first started owning and using cell phones; this included all UMG.

4.4 With whom do they talk to?

Out of 100 respondents, 49% owned and used cell phones to talk to their husbands and children (See Figure 15). Female friends at work and female relatives, when clubbed together, emerged as the second largest group of people with whom respondents communicate using their cell phone.

Figure 15: With Whom Do Women Talk To?

Ninety five percent of respondents do not share their cell phone with anybody. Among the remaining respondents, married women share their cell phones with their husbands and unmarried girls with their sisters and brothers. All who share their cell phone reported that despite sharing their device, they could get access to their cell phone very
easily, anytime they want. This fact could be also interpreted as - sharing of cell phone takes place only when anytime access to it is guaranteed.

4.5 How long do they own and talk on cell phone?

None of the respondents had used cell phones for less than a month and more than three years (See Figure 16). The average cell phone usage experience for respondents was approximately 13 months. Women married for more than 20 years, who were willing to be interviewed for the second phase, owned and used cell phone for at least more than nine months. But, all UMG owned and used cell phone for more than 2 years.

![Experience of Using Mobile Cell Phones Vs. Number of Women](image)

Figure 16: Duration of Using Cell phone for Respondents

There were 3 women whose daily usage of cell phones was far outside the overall range of minutes for the rest of the group. The respondent with the highest number of daily talk-time on her mobile offers beauty tips and advice using her training related to beauty and fashion. She spends 165 minutes on phone conversations with her clients in the vicinity of Bhor.

Another participant recorded her daily talk-time as 90 minutes. She is a Funds Collector by profession. Daily she collects payments from people who have invested in the Government of India’s Postal Savings Policy. The third outlier uses her cell phone for 70 minutes per day for her part-time employment. She chose not to disclose any other details related to her
employment. The average number of minutes per day spent on cell phone was found close to 11 minutes for the rest of the survey participants.

4.6 Who encourages or discourages them for using cell phone?

Almost three quarters (71%) of respondents were not encouraged at all by anybody from their family or society, for owning and using cell phones. Remaining 29% respondents were encouraged by someone from their family or social circle, for owning and using cell phones. It was found that husbands, children, female friends at work and relatives equally encourage MW. In addition, the same people also formed the exhaustive set of encouragers for the MW using cell phones. Whereas female relatives at work arises as the biggest set of supporters for UMG who own and use cell phones. No woman was encouraged by neighbors at all for using cell phones.

Ninety five percent of respondents were not discouraged anytime by anybody for owning and using cell phones. Unmarried girls were discouraged by relatives and others for owning and using cell phones. They preferred not to disclose people from Others Category, who discourage them for owning and using cell phones. No married woman reported of being discouraged by husbands, children, or female friends at work.

4.7 Why do they use cell phone?

The surveys also revealed a range of reasons for women’s usage of cell phone (See Figure 17). Employment emerged as the most prominent driver for the use of cell phone among these women. Mainly, women seem to be using their cell phones for personal, family-related, and financial reasons. Staying in touch with husband, children, family members, and friends formed a significant portion of reasons for owning and using cell phones.
members of a physically challenged respondent had given her a cell phone to be in touch with them, whenever required.

![Why Do Women Respondents from MGU Use Mobile Cell-Phones?](image)

Figure 17: Why Do Respondents from MGU Use Cell phone?

Interestingly, a respondent makes use of her cell phone as a medium to earn money, renting her device to other people for making and receiving calls. This is similar to that of phone-ladies from Grameen Communications, a Microfinance initiative run by Grameen Bank in Bangladesh, where financially disadvantaged women from rural areas use their cell phone for earning money. For some respondents, cell phones save their resources for walking and traveling; they use their cell phones to seek or convey information. The survey also identified one respondent who uses her cell phone just because others do it, thus in Bhor, cell phone is also seen as a status symbol or a fashion item.
4.7.1 Primary Sources of Income

On the background of seasonal employment at MGU, respondents were expected to rely upon some alternate sources of income, especially when there is no job available at MGU from June through December of each year. However, many respondents did not have “employment at MGU” as their primary source of income (See Table 3).

<table>
<thead>
<tr>
<th>Serial No.</th>
<th>Primary Source of Income</th>
<th>Frequency (# of Women)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Employment (part-time)</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>Mess (Diner in Bhor)</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Working at a Beauty Parlor</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Selling Home-made Flour and Spices</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Raising Funds for Non-Government</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Working at a Grocery Shop</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Selling Kerosene</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>Working at a Library</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>Selling Vegetables</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>Collecting Weekly Payments for Post-office Investments</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>Selling Self-stitched Clothes</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>Teaching at a Primary School</td>
<td>8</td>
</tr>
<tr>
<td>13</td>
<td>Stitching &amp; Repairing of Clothes</td>
<td>7</td>
</tr>
<tr>
<td>14</td>
<td>Collecting Funds</td>
<td>2</td>
</tr>
<tr>
<td>15</td>
<td>Selling Bangles</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>Working at a Stationary Store</td>
<td>1</td>
</tr>
<tr>
<td>17</td>
<td>Stitching &amp; Repairing Chappals</td>
<td>2</td>
</tr>
<tr>
<td>18</td>
<td>Foretelling Future (Astrology)</td>
<td>1</td>
</tr>
<tr>
<td>19</td>
<td>Working at a Bookstore</td>
<td>1</td>
</tr>
<tr>
<td>20</td>
<td>Working at a Kindergarten</td>
<td>1</td>
</tr>
<tr>
<td>21</td>
<td>Selling Bread</td>
<td>1</td>
</tr>
<tr>
<td>22</td>
<td>Working at a Montessori</td>
<td>1</td>
</tr>
<tr>
<td>23</td>
<td>Accounting</td>
<td>1</td>
</tr>
<tr>
<td>24</td>
<td>Selling Saris (traditional Indian dress for women)</td>
<td>1</td>
</tr>
<tr>
<td>25</td>
<td>Butler/ cooking</td>
<td>2</td>
</tr>
<tr>
<td>26</td>
<td>Teaching the Art of Tailoring</td>
<td>5</td>
</tr>
<tr>
<td>27</td>
<td>Tutoring of School Students</td>
<td>3</td>
</tr>
<tr>
<td>28</td>
<td>Partnering with a General Store Owner</td>
<td>1</td>
</tr>
<tr>
<td>29</td>
<td>Selling Traditional Indian Snacks</td>
<td>19</td>
</tr>
<tr>
<td>30</td>
<td>Working in a Dairy</td>
<td>1</td>
</tr>
<tr>
<td>31</td>
<td>Selling Stationary on the Move</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Primary Source of Income</td>
<td>Frequency</td>
</tr>
<tr>
<td>---</td>
<td>--------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>32</td>
<td>Helping at a Shop</td>
<td>1</td>
</tr>
<tr>
<td>33</td>
<td>Genitor at a Local Hospital in Bhor</td>
<td>1</td>
</tr>
<tr>
<td>34</td>
<td>Operating a Photocopy Machine (Xerox)</td>
<td>1</td>
</tr>
<tr>
<td>35</td>
<td>Working for a Cooperative Society</td>
<td>1</td>
</tr>
<tr>
<td>36</td>
<td>Selling Ayurvedic Medicines</td>
<td>1</td>
</tr>
<tr>
<td>37</td>
<td>Clerk at a Clothing Store</td>
<td>1</td>
</tr>
<tr>
<td>38</td>
<td>Helps in Running a Tea Stall</td>
<td>1</td>
</tr>
<tr>
<td>39</td>
<td>Working at a Flour Mill</td>
<td>1</td>
</tr>
<tr>
<td>40</td>
<td>Selling Glass Utensils</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 3: Primary Sources of Income Reported by Respondents (with daily wages less than $1)

The primary source of income for respondents was either a family run business, or a part-time employment, or a self-owned business. Selling bread, kerosene, home-made flours and spices, vegetables, bangles, sarees, milk, ayurvedic medicines, and glass-utensils are the most common family-run businesses in which respondents engage themselves part-time.

According to the RA, attending sessions at MGU serves as a networking exercise for its employees, where they exchange general information on current issues in the vicinity, make new friends, meet old friends, and experience female friends’ community outside their own families. It is important to note that despite drawing income from a variety of sources, no respondent had daily wages more than a dollar. This sheds light upon the nature of inexpensive labor cost in rural India.

4.8 **Are they comfortable enough to use their cell phone?**

Ninety eight percent of respondents did not experience any level of discomfort, while owning and using cell phone. Two MW were not comfortable using cell phones even after owning and using their devices for more than 9 months. All UMG were comfortable in using cell phones, irrespective of the duration of owning and using devices.
4.9 Do they use SMS? Which language do they prefer on cell phone?

Seventy percent of participants did not know how to use SMS on their cell phone. Remaining 30% of women knew how to use SMS. Only twenty three percent of participants use SMS. All women who use SMS knew how to use SMS on their own. Seven percent of women who knew how to use SMS did not use it. More than three quarters (78%) of participants had English as a language of instruction and communication on their cell phone. Three percent had Hindi as a language of instruction and communication on their cell phone, whereas 19% of participants had Marathi, the native language of Maharashtra, for the same purpose on their cell phone.

Sixty four percent of respondents did not have any problem with the existing language used on their cell phone; 5% of participants were not sure about it; whereas 31% of them had some sort of problem related to the language used on their cell phone. When asked about the language preferred on their cell phone, 25% of them inclined towards English, 2% of them preferred Hindi, 4% of them preferred both Hindi and Marathi, and finally, 69% of them believed that Marathi would be the best language for voice as well as data communication on their cell phone. Irrespective of the education level, a quarter of respondents were enthusiastic about English being used on their cell phones for instruction and communication purposes.

4.10 Do they rely on information gathered or received through cell phone?

Only one respondent always relies on information gathered or received through her cell phone; 27% of women never rely upon information they gather or receive via their cell phone; a woman admitted that she relies on information only when she receives or gathers it in private, in particular when she is alone (See Figure 18). For 63% of women the degree of
reliability on information depended upon the source of information. For 4% of women, timing of receiving or gathering information decided whether they would rely upon it or not.

Figure 18: Degree of Reliability on Information Gathered/Received via Cell phone

4.11 Influence of Advertisements

Respondents were asked about the influence of advertisement gimmicks used by cell phone companies. Fifty five percent of participants admitted that their decision making for buying cell phone was influenced by it. However, advertisements related to cell phones could not influence 41% of women with all UMG in it, while making decisions about purchasing cell phones. The remaining 4% of women were not sure about their response.
4.12 Perceived Risk

Participants were asked whether they feel or perceive any type of risk, while using their cell phone. Ninety six percent of women did not perceive any type of risk associated with their usage of cell phone. The remaining 4% of women, who all belonged to MW, perceived a variety of risks, while using their cell phone. One respondent noted that cell phones could cause brain damage and she expressed her concern about the possibility of being affected adversely in a long run. Two participants anticipated their cell phone being stolen or lost. One of them mentioned that she might forget her cell phone somewhere and could lose it eventually. One more participant recorded her fear stating that cell phone might cause neck trouble which could prove fatal, especially in the old age.

4.13 Effects of having Children on Cell phone Usage

This question was specially designed for participants who had children. Two percent of MW did not have children. From the remaining respondents, who were married and had children, only 7% mentioned various effects of cell phones on children. Women complained that - “children play games on cell phones all the time”, “children ignore studies”, “children keep listening to songs on cell phone and do not study”, “children ignore studies since they keep playing games on cell phones”, and “children keep listening to music and games”. On the other hand, some women admired their children’s familiarity and proficiency with cell phones – “children’s knowledge increases due to cell phones; my son knows more than myself”, and “mobiles increase level of knowledge in children; my daughter is in Montessori, but still she can play games on mobile”. Children’s ability to play games on mobile was criticized by some mothers whereas the same fact was praised by some.
4.14 Differences in Information Behavior of MW and UMG

Data analysis from the first phase indicated that out of 100 women who responded through the surveys, 30 MW and 13 UMG emerged as two groups with distinct information behavior. Members of both MW and UMG had significant demographic differences. All MW were above 36 years and all UMG were less than 24 years. MW were less than 12th grade educated, in contrast to UMG who held at least bachelor degree in arts, science, or commerce streams. All UMG released their cell phone number as a part of their complete contact information without even specifically asking them about their numbers. No one from MW, including the ones who were interested to be interviewed in the second phase of data collection, revealed their contact numbers voluntarily.

All UMG use cell phone for personal and family safety and security, whereas all MW rely on their cell phones for communicating with their husband and children. For MW their decision of using cell phone was affected by advertisement campaigns run by cell phone manufacturers and service providers. In contrast, nobody’s decision from UMG was affected by the advertisements. For more differences please refer to Table 4 below:

<table>
<thead>
<tr>
<th>#</th>
<th>Women Married for More than 20 Years (MW)</th>
<th>Unmarried Girls (UMG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low level of confidence when started using cell phone</td>
<td>High level of confidence when started using cell phone</td>
</tr>
<tr>
<td>2</td>
<td>Main reason for using cell phone: communication with husband and children</td>
<td>Main reasons for using cell phone: Personal &amp; family safety and security</td>
</tr>
<tr>
<td>3</td>
<td>Context of information needs: capital-based, family-owned businesses</td>
<td>Context of information needs: skill-based, self-owned service providing activities</td>
</tr>
<tr>
<td>4</td>
<td>Decision of buying cell phone was affected by advertisement campaigns run by cell phone manufacturers and service</td>
<td>Decision of buying cell phone was NOT affected by advertisement campaigns run by cell phone</td>
</tr>
<tr>
<td></td>
<td>providers.</td>
<td></td>
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<tr>
<td>---</td>
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<td></td>
</tr>
<tr>
<td>5</td>
<td>None of them would have used their cell phone more, if they been living in urban areas.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>None would have used their cell phone more, if they were younger.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>None of them knew how to use SMS (simple message text – text messaging), when they bought cell phone.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>None of them knew how to operate cell phone, when they bought it.</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>All preferred Hindi or Marathi on their cell phone.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Only 17% of them rely upon SMS as a mode of communication through cell phone.</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Even today, not all are comfortable owning and using cell phone.</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>All were tensed, while using cell phone for the first time.</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Husband or children or female friends or a combination of all, made them realized the need of owning and using cell phone.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>manufacturers and service providers.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>All would have used their cell phone more, had they been living in urban areas.</td>
</tr>
<tr>
<td>6</td>
<td>All would have used their cell phone more, if they were younger.</td>
</tr>
<tr>
<td>7</td>
<td>All knew how to use SMS when they bought cell phone.</td>
</tr>
<tr>
<td>8</td>
<td>All knew how to operate cell phones, when they bought it.</td>
</tr>
<tr>
<td>9</td>
<td>All would like to continue with English on their cell phone.</td>
</tr>
<tr>
<td>10</td>
<td>All rely upon SMS as a text mode of communication through cell phone.</td>
</tr>
<tr>
<td>11</td>
<td>All are comfortable in using cell phone, irrespective of the duration of owning and using their device.</td>
</tr>
<tr>
<td>12</td>
<td>None of them were tensed, while using cell phone for the first time.</td>
</tr>
<tr>
<td>13</td>
<td>All realized on their own the need of owning and using cell phone.</td>
</tr>
</tbody>
</table>

Table 4: Differences in Information Behavior of MW and UMG based on “Marital Status”

All UMG rely upon SMS as a text mode of communication through cell phone (See Figure 19). Eighty three percent of MW rely only on “voice mode” while using their cell phone.
All of the above mentioned demographic, socio-economic, inter-personal, usage-related, and psychological disparities between MW and UMG revealed distinct information behavior.

### 4.15 Similarities in Information Behavior of MW and UMG

There exist some similarities in the information behavior of MW and UMG. One of the most striking similarities is related to payment of bills for cell phones. All respondents from MW and UMG pay monthly expenses of their cell phone on their own. They do not depend upon anybody else to pay their monthly bills. Also, everyone from both groups expect to use information gathered through their cell phones sometime or the other. Source of information matters the most to all the women relying upon information gathered through cell phones. Nobody from both groups could always rely upon information gathered through their cell phones. Every woman respondent from both groups was consistent about their ability to use SMS and the actual act of using SMS. Eighty percent of respondents from MW and UMG make use of cell phone for more than one reason. Finally,
female friends at work seem to be encouraging the most, to all women from both groups, for owning and using cell phone.

4.16 Limitations of Survey Questionnaire

The surveys carried out in the first phase of data collection have generic limitations that are associated with a typical group-administered survey. This subsection focuses on specific limitations related to the design and development of dissertation research questionnaire. One of the limitations realized after fetching data was regarding a question that inquired about monthly payment of telephone bills. Brackets designed for the question could not fetch specific enough information about their expenditure pattern for cell phone bills. Brackets suggested to respondents were too broad; by designing smaller brackets the survey could have revealed some distinct trends related to monthly cell phone charges.

One of the questions from the surveys inquired about how frequently women use information gathered or received through their cell phone. Out of five choices, three choices were distinct enough – always, never, and other, however the remaining two choices namely, sometimes and rarely could not be translated with distinct shades of meanings in Marathi, the native language in which surveys were designed. There should have been just 4 choices in Marathi for this particular question rather than having 5 choices in the questionnaire, which was originally drafted in English.

To conclude, marital status emerged as the criterion for distinct patterns of information behavior among respondents. This criterion formed two groups – MW and UMG. Women who were interested to be interviewed from MW and UMG were interviewed on the phone in the second phase of data collection. The qualitative data collected from these interviews revealed various facets of information behavior of MW and
UMG, such as context in which their information needs are realized, ways in which their cell phones facilitate the process of satisfying their information needs, information-seeking behavior of those women using their cell phones, and ways in which information gathered or received via cell phones is processed and used by respondents.
Chapter 5

Context of Communication and Information Needs:
The Main Factor Controlling Information Behavior of Disadvantaged Women

Qualitative data collected through interviews, unraveled distinct paths taken by MW and UMG from the same socio-cultural setting, along their journey of information behavior, while owning and using cell phone. The lenses used to study the differences in information behavior of MW and UMG magnified nuances in context of information needs and various ways in which women make use of cell phones for satisfying their information needs, levels of stress and related coping abilities, self-efficacy for owning and using cell phone, risk and rewards associated with owning and using cell phone, psychological, demographic, interpersonal, environmental, and economic aspects of their information behavior, influence of cell phones in shaping their information behavior, various active and passive ways of seeking information while using cell phone, and finally, processing and using information received and/or gathered through cell phone.

5.1 Information Behavior of Women Using Cell phone in Rural India

Theory-driven content analysis of qualitative data unfolded the fascinating journey of interviewees from MW and UMG, while owning and using cell phones in Bhor. Interviews revealed that they own and use cell phones not just to satisfy their information needs but also communication needs. A physically handicapped, unmarried girl (the 5th interviewee from UMG) could become financially independent only because cell phone enabled her to communicate with the outside world. Her information needs are often fulfilled by her cell phone. She is required to call her supervisor in order to keep herself updated with ongoing activities at her workplace, which was impossible to her earlier in the absence of her cell phone.
phone. She is also expected to report her supervisor daily, even when she does not go to the work. Cell phone has played a key role in maintaining her financially independent status.

For the last 2 years I have been working as AangaN Wadi Sevika* [one of the government appointed teachers for schools that cater to needs of aboriginals]. If we have a "meeting" or some similar event, I am required to call "madam" immediately. That is another reason for buying mobile… "Madam" is our "supervisor". We all AangaN Wadi Sevika are required to call our "supervisor" regularly. We all maitrinee* [a word for female friends] have mobiles...Mobile is of great use to me. I am a "handicapped" person. We don't have a vehicle to commute. In order to catch a "bus"*(this word is used in rural Maharashtra for referring to a state transport vehicle) we need to walk 3 kilometers. If I get late in the night after attending meetings, then I could convey my home (using my mobile), and somebody can come to pick me up. They let me know, if we have any meetings to attend. – UMG-5

For the handicapped interviewee (UMG-5), cell phone is a key source of communication to seek and convey information to the outside world, sitting at one place.

If I wish to ask anything about the school, or any other advice, I call them, she also calls me sometimes... "Tower" is close by at 2 kilometers, so "range" is not a problem. – UMG-5

Cell phone has played an indispensible role in satisfying her communication and information needs.

Need of communication with the outside world was discovered as a basic need experienced by respondents from Bhor. Communicating different types of emotions, daily events, feelings, and opinions played a significant role in respondents’ lives. At the same time, seeking information for various purposes, gathering opinions from various learned and expert people, and searching different types of information were some of the absolutely essential acts of communication for respondents. Since cell phone offered a great flexibility
to respondents for receiving, consuming, and disseminating information in person as well as in group settings, cell phone acts as one of the most convenient modes to address women’s need of communicating information. Thus the dissertation research refined Context of Information Needs, one of the five constructs from Wilson’s Model, to Context of Information and Communication Needs. Here onwards, this modified name is used in the study.

5.1.1 Collective Information Behavior for MW and UMG

Frequency count of constructs, namely, context of communication and information needs, information-seeking behavior, and information processing and use revealed the influence of context on respondents, while owning and using cell phone in rural India (See Figure 20). Almost 76% of frequencies accounted for context in which respondents realize and meet Communication and Information Needs using cell phone.

![Figure 20: Context Ruling the Information Behavior of Disadvantaged Women](image)

In order to compare and contrast information behavior of MW and UMG, frequency counts for the Model’s constructs, from interview transcripts were normalized. Context of Communication and Information Needs equally influences MW (48.7%) and UMG (51.3%) (See Figure 21). UMG were found more active in seeking information compared to MW.
Information Processing and Use construct from the Model focuses on various types of barriers faced by people acquiring information through various means. Barriers to information processing and use for UMG were greater than that for MW, while owning and using information acquired through cell phone. Information-seeking behavior which consists of active and passive ways of information seeking, searching and attention, play a greater role in the information behavior of UMG (68.1%) as apposed to MW (31.9%) (See Figure 21).

![Figure 21](image)

Figure 21: % Frequency Distribution of Information Behavior of MW and UMG

Out of different sub-constructs defined for context of information needs (Wilson, 1997), social motives emerged as the strongest motive for the need of information (See Figure 22). Unlearned motives addressing curiosity and eagerness to seek information was the lowest ranked sub-construct for context in which communication and information needs were realized or felt by UMG and MW, while owning and using cell phone.
The Model categorizes information-seeking behavior in active and passive elements with ongoing search and active search as active elements, whereas passive attention and passive search as parts of passive elements (Wilson, 1997). For MW and UMG, active ways of seeking information using cell phones dominated passive ways of receiving information (See Figure 23).
The dissertation studied information processing and use in terms of different types of barriers faced by interviewees. Based on the Model, the research categorized the overall barriers into human barriers and technical barriers. Human barriers to processing and using acquired information typically exist due to frameworks of knowledge, beliefs, and values inculcated among users. Technical barriers consist of problems in accessing cell phone networks due to the lack of signal or distance from transmission towers. Unavailability of electricity, inability to use SMS on cell phone, hurdles in charging cell phone battery, atmospheric noise, dropping of calls, and incompatible typing pads on cell phones created obstacles for MW and UMG, while processing and using information through cell phones. In Bhor, there were more human barriers (62%) than technical barriers (38%) as experienced by interviewees from MW and UMG (See Figure 24).

![Figure 24: Collective “Information Processing and Use of Information” Acquired Using Cell phones by MW and UMG](image)

Based on the results of the content analysis of interviewees with MW and UMG, the following sub-sections compared and contrasted various components of information behavior demonstrated by UMG and MW.
5.1.2 Context of Communication and Information Needs

It is critical to understand context, before situating the action of owning and using cell phone by disadvantaged women in Bhor. The intended meaning of respondent’s statements, opinions, and expressions could have been conveyed correctly, if the process of interpretation begins with context (Dey, 1993). Context in which information needs were realized and experienced by participants, was a key to interpret meanings of their interviews translated in English. Interviews conducted by a native speaker of Marathi, who was born and raised in similar social settings as that of respondents, eliminated the possibility of misinterpreting contexts; although there still exists an urban-rural cultural gap between interviewees and interviewer as discussed earlier. But after frequent clarifications sought from interviewees, there remained a remote possibility of misinterpreting meanings associated with responses from interviewees.

Through many events, interactions, and circumstances, needs of varying levels for different types of information are realized by MW and UMG. Cell phone has been perceived by interviewees as one of the most effective sources of satisfying information needs in Bhor. The analysis of qualitative data helped to classify various contexts in which information needs are realized by interviewees. Social motives, physiological motives, and affective needs are powerful causes for MW compared to UMG, while using cell phone (See Figure 25).

Figure 25: Components of Context of Communication and Information Needs on % Scale
In contrast, subjective needs and cognitive needs are predominant reasons for using cell phone for UMG compared to MW. Scores for unlearned motives for using cell phones were equal for both MW and UMG.

5.1.2.1 Social Motives of MW

Husband, children, and female friends were instrumental in making MW realize their information needs and the crucial role of cell phone in satisfying those needs. An illiterate, married woman interviewee knows how to receive and make calls only. However, she uses a cell phone to be in touch with her husband, who is a driver by profession.

Hee-bagha* [means "you see"; the form of this verb which she used in Marathi, is typically used while talking with respected people or elderly people. She used this form of verb "see" to indicate her respect for the interviewee, although she is elder than the researcher], I am an illiterate woman. I don't understand anything about phone. Only things I understand are - to receive calls and to make ones. Are tumhi* [Again, this form of "you" in Marathi is used to show respect towards unknown or towards elderly people. She refers the researcher with respect] hearing there? My children are very very clever in using phone (This might sound grammatically incorrect, but that's exactly she wanted to mean). Are tumhi*[referring the researcher with respect again] there? My husband is just a driver. Phone is useful to me in finding out about when he would come back home, where is his vehicle, etc. Children ask me whether aae *[a common word for mother in Marathi], you need our help in making calls. Or else I make a call from coin-box *[In India, this is a type of public telephone which operates on coins]. I use phone for all these reasons, moreover, my children had hous *[in this context, this Marathi word means enthusiasm] as well. My children used to say that other children have mobile, so we should also have one. So their father has bought mobiles to all of them. – MW-10

In some instances, due to their family and relevant responsibilities, women pursue their information needs using cell phone.

I live in a rural area near Bhor. With my insignificant service, I work for a hospital in Bhor. I can get any help I need using mobile. My mother is old plus I have old sisters. I set out at seven in the morning and return back at around 6 in the evening. So, I
have been benefited a lot by mobile. Patients from the hospital can contact me anytime and I can help them. When I am not in a position to help them, I could at least guide them. Plus, I could tell other nurse that I am coming, let us take this particular preparation, etc. Earlier I never felt that mobile was of any use, but recently in the last year I started feeling the need. – MW-5

In a similar incidence, a married woman who perceived that cell phone was not a necessary investment for her, eventually ended up buying mobile because of her need to communicate with children at anytime of the day.

Even I also did not like using cell phone in the beginning. Children also do not need mobiles. But now, my son and daughter are in Pune (the closest city to Bhor), and we can carry mobile anywhere we wish. So we can contact each other anytime…It is best to use mobile only to take care of our needs. – MW-4

5.1.2.2 Social Motives of UMG

For UMG representing younger generation, sometimes information needs are realized in the context of their relationship with parents. An unmarried girl uses a cell phone for seeking her parents’ help, saving on her long-distance travel.

If I go out to some other village, I could contact my parents. I do some jobs here, so if there is anything important to share, then from my workplace, I can contact my family anytime. After giving them a message, they can bring things that I need from home. – UMG-9

For another young unmarried girl, cell phone is an important communication bridge with the surrounding world. Cell phone seems to be used extensively by younger generation for supporting each other and maintaining social relations.

Mainly to maintain "contact" with all, and to "connect" with all. If we worry about someone, then we call that person and he can call us back… – UMG-8
5.1.2.3 Affective Needs of MW

The 2\textsuperscript{nd} interviewee from MW realized the need of using cell phone, when her husband and son met with an accident. The role played by cell phone in that emergency situation made her perceive cell phone as an effective tool for communication.

My Mister\textsuperscript{*} [\textit{Word is used to indicate husband}] had gone to Shirwal (a nearby town) for his work, where he and my son had an accident. My son had a mobile and we had a landline at home, so they could communicate us urgently. We were told - “Asa asa\textsuperscript{*} [\textit{This phrase is used to indicate something that has already been told in the conversation}] happened, and come immediately.” Since then we required mobile...this happened two years ago. – \textbf{MW-2}

Expensive landline communication triggered an interviewee from MW to use a cell phone, who was initially against using it. Affordability of her cell phone saved her money on communication. The interviewee said:

Initially, I was against using mobile. We had a landline, but after being employed, my children started using mobile. They used to make calls on our landline, which increased our bill extraordinarily. Finally, I also decided to use a mobile. I switched from landline to mobile...My children used to tell me, “Aace\textsuperscript{*} [\textit{a word for mother}] why don't you call us (on our mobiles)?” So making (long-distance) calls from my landline to their mobiles hiked my (landline) bill. – \textbf{MW-3}

In some instances, interviewees realized their information needs in more than two contexts. Realization of information needs in both social and economic contexts was the most common overlap. Information needs experienced, while pursuing socio-economic opportunities by both husband and wife encouraged them to buy a cell phone for the wife.

Namaskar\textsuperscript{*}, saheb\textsuperscript{*} [\textit{These words literally mean - Hello, Master/owner. However, she used this form of greetings to show her great respect for the interviewer}], I can get my things done fatafat\textsuperscript{*} [\textit{a Marathi word for ‘swiftly’}]. I own a small business of papad\textsuperscript{*} [\textit{traditional Indian snack}]. Five years ago, when I did not have mobile, I used to visit each and every home in Bhor to sell papads. Soon we realized that I had to get one mobile. Now I can get things done fatafat.
Customers call me on my mobile and could pick up their order from my home. I can make urgent calls using my mobile. My husband works for grampanchayat* [government's unit in a village]. I can contact him anytime, if required. He (my husband) conducts classes every Sunday, so his students can contact him even on my mobile, if his mobile is busy or not working. – MW-11

5.1.2.4 Affective Needs of UMG

For an interviewee from MW, the realization of information needs occurred for communicating her safety and security to her family, while working at a distant place.

I used to do a job at Pune. I had bought a mobile then. I used to get late while returning from my job, so my family members used to worry about me all the time. I used to commute everyday between Bhor and Pune. It takes one and a half hour between Bhor and Pune. – MW-6

One unmarried girl interviewee, who is also physically handicapped, is required to call her supervisor in order to keep herself updated with ongoing activities at her workplace. She is also expected to report her supervisor, when she does not go for work. Cell phone has played a major role in keeping her financially independent.

5.1.2.5 Cognitive Needs of UMG

Need for information in the form of emotions and supportive words is realized and pursued, when bonding with friends, relatives, and other people in the cell phone holder’s social circle. The 6th interviewee from UMG uses cell phone for social-networking, mainly for strengthening emotional bonds within her social circle. Her colleagues from workplace make use of her mobile as a point of contact, when resolving day-to-day work-related queries. In her own words:

At times, mobile has definitely great utility value. If something goes wrong with any friend and if I cannot visit that friend, then at least I can call him to condole. Many a times, people just need our supportive words. Even if we are not able to be with our people physically, our words could support them at times. Mobile
can be of great help. We can even offer and seek advices from each other through mobile. It is really great!...For personal reasons, office related work, if I know something which others don’t know, then even in that case they can talk to me (on my mobile). – UMG-6

UMG often make use of cell phones for keeping in touch with friends and even making fun of each other at times. Information regarding their plans for meeting each other and get-together is often shared over their cell phone. Cell phone is widely used as a socializing tool by UMG.

My “best friends” keep teasing me from different numbers. Friends call me just to ask my whereabouts or when we plan to go out. Nowadays I don’t get to see my friends, so we keep in touch through cell phone...I have good relations with many people, which are maintained through my mobile. – UMG-7

When information needs can be satisfied exclusively by experts or knowledgeable people, women tend to use cell phone for seeking knowledge in no time. Special piece of information such as password is also communicated over cell phones, where the need for password could be realized at workplaces.

When I need some information and I think that a particular person might be more knowledgeable, then I call that person to seek more information...Once my friend had called me to ask for a “password” to my “desk”. Sometimes my colleagues call me, when they don't understand the ways in which I have completed some assignment. – UMG-6

5.1.2.6 Subjective Needs

For some interviewees, information appeared to be as basic necessity similar to primary needs of food, shelter, and clothing. For some UMG, information need gets realized in group, however, they decided on their own to buy cell phone. The 3rd interviewee from UMG uses her cell phone only out of her need to seek information. She communicates with
others only for important reasons. She does not see cell phone as a medium to get entertained by others.

I use mobile for a need, only for making important phone calls not for entertainment. – UMG-3

5.1.3 Information-seeking Behavior

Active elements in information-seeking behavior consists of ongoing search and active search, whereas, passive elements for information-seeking behavior is composed of passive search and passive attention (Wilson, 1997). For unmarried girls, ongoing search is clearly the most practiced aspect of information-seeking behavior (See Figure 26). They rely on their own efforts to seek and search information on cell phone.

Passive search element plays a very insignificant role in the information-seeking behavior of UMG and MW. However, passive attention (frequency count: 37) holds equal influence as
that of ongoing search (frequency count: 36) for the information-seeking behavior of MW. For an interviewee, mobile was just a technology to communicate any information, nothing more than that.

Conveying and receiving messages was the main reason for using mobile. I have been using it for more than 2 years now. – MW-7

MW-7 sees cell phone as a medium for both active and passive elements of information-seeking.

5.1.3.1 Active Elements

In some cases where an interviewee did not even have a landline phone for communication, she decided to pursue their information needs through cell phone.

At our home, we did not have phone, even a “landline”. We always used to rely on our neighbors for calls, either for making or receiving. It does not feel right to bother neighbors all the time, isn't it? So it was decided to buy a mobile. – UMG-3

This is a perfect example of leapfrogging in terms of adopting new technologies. This phenomenon is specially observed in developing nations, where people adopt newer and cheaper technologies. The same type of leapfrogging was also resonated in an interview with an unmarried girl,

We did not even have landline in early days. Not any other phone as well. Hence, I bought a mobile for me. – UMG-2

For women entrepreneurs in Bhor, cell phones were multipurpose devices that took care of their information needs realized not only in the social context but also in the economic context. In addition, cell phones were used heavily for pursuing active as well as ongoing searches of information.

Now I own a small grocery shop in Bhor. On one call I can get market rate for goods in different areas. I did not have any other tool to do that earlier. Hence, we decided to buy this phone. When we are doing business, we should buy everything that is
required for business. Isn't it? There is no octroi tax * [this is a tax charged by municipalities in India for transporting goods from one municipality's jurisdiction to another] now here in Bhor, goods are available in Bhor as that of Pune's rate. So now I buy goods in Pune on the phone. Due to mobile it becomes easy to contact wholesale shopkeepers in Pune...I order goods using a mobile. I can also reach teachers of my children who attend school regularly. During the exam period, I can talk to my children by calling on their teachers’ cell, and ask them, how long is it going to take them for returning back from the school? – MW-9

5.1.3.2 Passive Elements

The 12th interviewee from MW group receives different types of information on her cell phone from various sources. She makes use of that information for social and economic purposes.

We get a lot information using mobile and it has great benefits. Our relatives and I prepare papad and kurdaee* [traditional Indian snacks], and I receive calls regarding that. I prepare and sell those items to my customers regularly. Also, if there is anything else happening, I get to know about it from others on my mobile. For example, if someone expires I can be immediately informed on mobile. People can't travel all the way here, so they inform me on the phone...If someone places orders over the phone, I prepare and deliver them, or my customers come and pick them up. For talking with customers and for all the practical reasons, mobile has proven to be very useful to me. Everywhere people use mobile for information, so we thought let's buy one. – MW-12

The first interviewee from UMG makes use of passive attention received through her cell phone for earning primary source of income.

People call me to ask about their horoscopes. For seeking appointments or asking personal questions my clients call me in afternoons and evenings. For some people, if personal visits are not possible, then we communicate and I consult on my cell phone. People ask me on my phone if there are any problems in their horoscopes, or if they need to carry out any rituals- UMG-1

5.1.4 Information Processing and Use

Data suggest that technical barriers experienced by UMG and MW were approximately equal (See Figure 27). However, when compared with MW, UMG faces more
human barriers in processing and using information which is acquired using their cell phone.

MW experience almost equal level of technical and human barriers.

Figure 27: Human and Technical Barriers to Information Processing and Use on % Scale

5.1.4.1 Human Barriers

Many UMG and MW expressed their concerns about people’s tendency to discourage and create hurdles for women using cell phone. Such people act as human barriers for their information processing and usage. The 5th interviewee from MW whose husband passed away between the first and second phase of data collection of this dissertation said:

I cannot tell exactly how many times I receive such calls in a month, but they do come sometimes. They make fun of me by calling anytime. Aata-tumhala-khare-sangayche-zale-tarr* [literally means – Now if at all I decide to reveal you something, I will tell you something. This phrase is used in Marathi, when one person trusts another and now wishes to share something important; by using this phrase interviewee wanted to show trust in the researcher, and is going to share something important with him] I am a widow. Mi-swatahachya-payavar-ubhi-aahe *[literally means, I am standing on my own feet; this phrase is used to show independence status of a person, especially in extremely difficult circumstances], so many people do not approve of it. People
trouble me. I use bicycle for commute (it is not very common in Bhor to have women bicycling on streets). People who don’t approve of this, get my mobile number from somewhere and try to discourage me from what I am doing. But due to mobile, I can tell them that I don't want to talk to strangers and cut my calls, or I am busy and I don't wish to talk to them then. People trouble me in different ways. They create hurdles for me… Trouble-makers try to bring me ill-fame at places where I work; they call me and talk about dirty things. – MW-5

This type of human barrier is not just limited to MW, but also experienced by UMG. The 7th interviewee from UMG seemed really worried about this social tendency of creating problems for females who use cell phones in a rural area like Bhor.

If my number goes to any strangers and if they have any information about myself, then they can bring me into trouble. Although it has never happened like that before…Some people are really sick, they have bad mentality of teasing women by calling them frequently. – UMG-7

The 4th interviewee from MW also expressed her objection to use of cell phone for dirty talks by unwanted people on unwanted calls.

I receive unwanted calls from unwanted people. They talk dirty. Now if I had a young daughter at home, she would have got influenced badly due to such dirty people and their dirty talks on mobile. You see, people get spoiled in youth. So mobile has to be used properly. – MW-4

Unwanted calls from telemarketing advertisers create another type of human barrier for the 10th interviewee from UMG.

I receive a lot of "unwanted calls". Nowadays, "marketing" through mobile is in boom, which is very troublesome. Although there is no risk as such. In India, nowadays, these people market "Insurance" and "investment policies" through mobile. Those companies keep on calling you all the time, and they call from different numbers. So I am not able to decide whether to pick up calls from any specific number. Aapan* [this is a special type of word
used by her, which indicates that this not just happens with her, but with all mobile users] usually are in rush for work, and by mistake aapan* pick up their calls. And that call is usually of an unwanted advertisement. Except this problem, mobile is very useful. – UMG-10

Rumors spread by people regarding the usage of cell phones spread confusion, doubts, and fear among people, including women who use cell phone.

In the past, people scared me for using mobile. They told me that weird sounds could come from the mobile, or it could burst anytime, so I was afraid of using my mobile. Nothing else. There used to be phone call which used to say, you will be in trouble if you use mobile. Some people also used to say, never pick up your phone when red colored light lits on your mobile. Those people used to scare us. I used to feel tensed while picking up calls on my mobile. All kids used to say that never pick up calls when red light is on. So I used to be scared and in dilemma about whether to attend a phone call or not. – MW-7

In contrast, the 6th interviewee from UMG seems to be enjoying human barriers to her information acquisition, processing, and usage.

The first thing is "blank-calls", you see when there is a "cross-connection", it is so much fun. One person had called me once, and then he kept on calling me the whole day. He kept on saying "Rekha, please forgive me, please I swear". And I kept on telling him that I am not Rekha. At last I asked my brother to talk to him. My brother told him that the person you are calling is not Rekha. After that only he stopped. – UMG-6

For the 11th interviewee from MW, her mother-in-law opposed her from owning and using a cell phone.

We live in a joint family. In the beginning, they did not have given consent for it. I have mother-in-law living with me. For a variety of reasons, she always resisted me for buying a mobile. She opposed me a lot. She used to ask me - What is the need? It would be a great trouble. People would keep coming to you for using your mobile. Someone might say can I talk for just 10 minutes? etc. Plus we live in a wada*[an old fashioned big house inherited from ancestors. Nowadays, many different families live together in
these types of constructions], so we cannot say no to anybody. For all these reasons, my sasubæ*a respectful word for mother-in-law used to oppose us from buying a mobile. We thought a lot about it. But we did not rush at all...Almost a year or year and a half passed away...Afterwards, my sasubæ* was convinced that her sunbæ*[a respectful word for daughter-in-law] is making good use of mobile. Mobile has proven to be of great use to us.

5.1.4.2 Technical Barriers

Due to lack of electricity, the 5\textsuperscript{th} interviewee from MW cannot charge her cell phone anytime she wants.

Everyday we have light*[this is a word typically used in rural Maharashtra to indicate electricity] for 6 to 7 hours. I charge my mobile during that period. If light* goes away in mornings, it comes back in evenings; if it goes in evenings, then it returns in mornings. So during that short period I charge my mobile. – MW-5

Interviewees owned cell phone manufactured by Nokia and Reliance with service provided by some of the leading providers such as Reliance, Airtel, Vodafone, and Tata. The 3\textsuperscript{rd}, 8\textsuperscript{th}, and 11\textsuperscript{th} interviewees from MW had contemporary Hindi movies’ popular songs as their ringtones. Whenever I called them, I used to hear popular Hindi songs till someone answered my call. Certain mobile service providers like Airtel repeat standard messages recorded in Marathi, Hindi, and English. This feature caters to needs of multi-linguistic society. Designs and interfaces of cell phones also create technical problems for its users. Due to unfriendly keypads on cell phone for typing SMS in Marathi, the 10\textsuperscript{th} interviewee from UMG cannot use Marathi SMS feature, despite having the penchant for it.

I would like to have Marathi on my mobile rather than English, because Marathi is my mother-tongue. "Rather" I have Marathi on my mobile. It is "in-built" in my machine. But the problem is "Marathi typing" is troublesome to use. Because we are used to English for "daily routine". Marathi typing is difficult, so mostly English is used. – UMG-10
Range and mobile signals act as technical barriers for women living at the bottom of hills near Bhor.

Many a times it happens that relatives call me and range does not reach here. – MW-5

Such women climb on ladder with cell phone in their raised hand. Once the call is connected, they come down and usually, signal is not lost.

5.1.4.3 Overlap of Technical and Human Barriers

Some barriers shared by interviewees were combination of both technical and human obstacles in using cell phones.

For the first time when I bought mobile, for first 15 days I could not use it. When I asked them about this, they said my papers have not reached the particular office. But then I said, when I had bought phone, I had submitted all the documents. I could never get what went wrong in those 15 days. I asked them what is this non-sense? I am not able to either receive or make calls. What is going on? They told me that since your papers did not reach us, we disconnected your mobile. I scolded them. Then they apologized to me. They said sorry to me. – MW-5

Thus 12 interviews of MW and 10 interviews with UMG resonated with a research finding that “different groups of women have different needs and interests (Wajcman 1991, pp. 11)”. As a part distinct communication and information needs, MW and UMG pursue different ways for satisfying their needs. However, context plays a major role in shaping their information behavior. Their journey of using cell phone enables them to benefit from socio-economic opportunities in a rural context.

Above inferences drawn from the content analysis are based upon the frequency count of codes, which were built by the operationalization of constructs from the Model
(Wilson, 1997). The inferences from the second phase of qualitative data collection reveal the information behavior journey of UMG and MW, with its implications on socio-economic opportunities opened up to the participants in rural India. Since the dissertation research does not look forward to generalize any of the inferences and/or findings to any context beyond the dissertation research, those inferences take the form of conclusions for this dissertation research design. The next chapter discusses conclusions drawn from data and results presented in this chapter.
Chapter 6

Socio-economic Opportunities: Derivate Effect of Using Cell phone

The dissertation research was situated in the context of strong advocacy by the United Nations (UN), the World Bank (WB), the International Telecommunications Union (ITU), and other international organizations, for deploying ICTs as an effective way of offering socio-economic opportunities to disadvantaged populations from developing nations (See Figure 1 above). ICTs always cater to basic needs of people, empowering them for achieving development (Fors and Marino 2002).

Unlike other technological changes, the rapid developments and diffusion of communication and information technologies and the emergence of interactive multimedia applications have the potential to affect all economic sectors, organizational and work structures, public services, cultural and social activities. (OECD 1998, pp. 7)

Collaborative business practices between the public sector and private sector facilitate governments to build ICTs infrastructure. Reviewing and reassessing existing economic, institutional and legal policies, and providing access and appropriate incentives to private sector organizations for building competitive market structures for ICTs are expected to facilitate the process of building tomorrow’s Information Society (OECD 1998). Thus investments in ICT infrastructures by the public sector and private sector offer citizens an access to ICTs.

However, various studies lead us to believe that access to ICTs alone, is not enough to enable disadvantaged populations to explore socio-economic opportunities.

It is the individual and not an invention that determines the use of which it is put, within the limit of the capacity of the instrument…the invention does not determine to which use it will be put. The variable is the person; the invention is a constant. (Allen 1957, pp. 18)
Technology is inherently believed to be neutral in nature; it is human being’s applications that decide the value of technology in society. Recent studies show that higher the skill level, higher is the usage of ICTs and hence such skilled people are likely to be benefitted from their ICT usage, enhancing their socio-economic status (ITU 2009). However, affordable access to ICTs, quality of ICTs, knowledge and skills for using ICTs, and finally, actual usage of ICTs decide whether disadvantaged populations are able to apply ICTs for exploring socio-economic opportunities or not.

After accessing ICTs, illiteracy, lack of education, lack of skills, lack of training to use ICTs pose barriers for women to participate in the digital economy (Teltscher 2002). But in any event, ICTs have the potential to enable users for transmitting, storing, and accessing enormous amount of information at higher speeds but lower costs (Fors and Moreno 2002, OECD 1998). Irrespective of types of barriers faced by people who have access to ICTs, information acts as one of the major driving forces for building economies and restructuring social relationships. Hence the dissertation claimed that it is significant to study changes in ways in which users who own and use ICTs, acquire, seek, search, store, process, transmit, and use information. The above mentioned changes in information related skills are studied by a research area called information behavior (See Figure 32). The dissertation research focused on the linkage between access to ICTs and information behavior of users.

Figure 28: Infrastructure-Access-Information Behavior-SE Opportunities

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With over 4 billion subscriptions worldwide which equals to 61% penetration rate for the entire world population, cell phone is the fastest growing ICT in the world (ITU 2009). Cell phones are inexpensive devices; they are widely used in rural as well as urban parts of India. Cell phones avail capturing, storing, processing, and communication of information in private to its users. The exponential sales of cell phones confirm that mobile mode of communication is popular in a developing nation like India as well. Hence, this dissertation studied the linkage between cell phones and the information behavior of disadvantaged population in India.

For a long period of time, social scientists have studied the place of technology in society and the impact of technology on society. The interrelationship of society and technology is of two kinds. The first is that sociological settings give rise to technological innovations and to their use by society, and the second is that technological innovations and discovery affects society and overall social settings (Allen 1957). To be precise, the dissertation studied the linkage between cell phones and information behavior of disadvantaged women, and the role of cell phones in shaping their information behavior with its implications on socio-economic opportunities opened up by cell phone.

Cell phones in Bhor are not restricted to any single manufacturer. Sampled women in Bhor use cell phones manufactured by Tata, Nokia, Motorola, and Reliance. Phone service was provided by Vodafone, Tata, Airtel, Idea, and Reliance. There is a competitive rural market for cell phones in Bhor. Quantitative data analysis revealed that marital status was the main demographic factor responsible for distinct pattern of information behavior among 100 surveyed women, forming two groups namely, UMG and MW. The dissertation proved that for MW and UMG socio-economic opportunities are derivative effects of access to cell phones in a rural context. The following sub-sections provide background and
rationales for the above conclusion, situate the conclusion in the context of communication and information needs, and discuss various impacts of access to cell phones.

6.1 **Cell phone: Private Property vs. Communication Gateway**

Women with a significant variation in their age (from 18 to 52) work seasonally at MGU. All UMG released their cell phone number as a part of their contact information along with their physical address. They consider cell phone as an intimate part of their contact information as opposed to MW who do not consider digital mode of communication as a way to reach them by people other than their family, friends and acquaintances.

All UMG see owning and using cell phones as a direct value addition to their knowledge, which does not seem to be the case with MW. All MW associate cell phone number with the concept of “private property” in their life, in contrast, UMG consider cell phone as a “gateway to communicate” with the rest of the world. In addition, for UMG, cell phones are tools for facilitating their daily routine and running daily errands.

6.2 **Scarce Socio-economic Opportunities in Bhor**

Half participants are at least college graduates and still they earn less than a dollar per day. This shows scarcity of economic opportunities in Bhor. The fact that illiterate women earn almost the same daily income as that of postgraduates shows that there is no correlation between education and income, in a rural context like Bhor. The lack of economic incentive for higher education could undermine the value of education in rural India. However, it can be expected in the future that diffusion of cell phones would significantly impact productivity (OECD 1998), offering knowledge intensive employments in Bhor. This could further reinforce the significance of education in rural India.
6.3 Diverse Primary Sources of Income

It is important to note that employment at MGU is seasonal. Most married participants in this research either support their families in running family-owned business or rely on low capital-based business as their primary source of income. In contrast, UMG rely upon skill-based sources as their primary sources of income. Primary sources of income such as stitching, working at beauty parlors or hospitals are skill-based jobs, whereas selling glass utensils, ayurvedic (traditional ways of healing life) medicines, bread, kerosene, home-made flours and spices, vegetables, bangles, sarees, milk, ayurvedic medicines, and glass-utensils, or running photo copy machines are capital-based sources of income. Since banks and other financial sources in India require collateral to lend loans to their customers, a huge section of the Indian society does not have access to financial capital. Women from disadvantaged strata of the society cannot afford to raise capital on their personal credentials to own a business. As discussed earlier, in the traditional, male-dominated Indian society, girls are trained from childhood to prepare food and traditional snacks, hence there is no learning curve at all for women working at MGU. Also, they are expected to bring along their own cooking equipments for preparing snacks at MGU. Thus working and earning income at MGU requires neither any training nor any type of investment. Hence, whenever there is a work available at MGU, majority of women seem to prefer MGU as a primary income source over any other source.

6.4 Research FOR Women and NOT on Women

This dissertation was always perceived as a research for women and not on women; this approach was reflected in many aspects of the research design, especially while interacting with participants in data collection phases. In the first phase of data collection, privacy and opinion of women who did not wish to be part of surveys was respected and
they were allowed to drop out. In the second phase of data collection, utmost precautions were taken to avoid any type of possible trouble to interviewees. Setting up interview timings with participant was one of the ways to take precautions for learning the journey of cellphone users. Twenty two interviews - 10 UMG and 12 MW - were conducted. The dissertation research proved that women were given a voice and not just treated as a stereotypical group based on their gender.

Conducting interviews on telephone was one of the best ways of understanding women’s experience of owning and using cell phones. Due to characteristic socio-cultural context in rural India, women who were interested to be interviewed on cell phone were not willing to be interviewed face-to-face, particularly because of a male interviewer from a higher caste. In Maharashtra, the last name of a person embeds his or her caste, so from the researcher’s last name interviewees easily understood his caste, and they were reluctant to be interviewed face-to-face.

Moreover, for face-to-face interviews, venue for interviewing women could have created huge problem. Since women either stay at home or visit MGU for a seasonal employment, there was no social place in Bhor, where the researcher could have spent time with women for conducting their interviews. Their families would have never allowed them to talk to a stranger from a higher caste. Data collected with all such considerations of social constraints for women definitely helped interviewees to share details of their experience relevant to the research problems of this dissertation.

6.5 Differences in the Information Behavior of MW and UMG based on the Qualitative Analysis

Content analysis of interviews given by women revealed that unmarried girls are extraordinarily active compared to women from MW, while seeking information through cellphone. This is one of the reasons for having more barriers for processing and using
information acquired by UMG compared to MW. Both MW and UMG face more human barriers than technical barriers, when processing and using information acquired through their cell phone. This fact re-underlined the influence of context over their information behavior. Some UMG are discouraged significantly by their relatives for owning and using cell phone. Relatives and family tend to put young and unmarried girls under more restrictions compared to MW. However, due to common infrastructure problems such as lack of electricity to charge cell phone and weak signals, low range or no range at all, UMG and MW face technical barriers equally. In some instances, they need to walk some distance to catch hold of a strong signal so that they could communicate using their cell phone.

Typically, areas at the bottom of a hilly area near Bhor do not seem to have a strong signal network, people in that area climb hills in order to communicate using their cell phone.

On an average, MW have greater socio-economic needs than UMG, and more number socio-economic needs of MW get satisfied by their cell phone, when compared with UMG. In rural India, married women are expected to be care taker of their husband’s family including their children, and his relatives; at the same time, MW maintain their contact and communication with their own parents, siblings, and relatives. In contrast, UMG do not have husband and hence his relatives to maintain relationship with, which reduce their social motives to use cell phone. Moreover, MW are also responsible to assist their husband and in-laws for earning bread and butter for entire family, which is often not the case with UMG. In India, usually after marriage, daughters do not share their income with their parents but with in-laws. In rural India, typically married women assume more family responsibilities compared to unmarried girls. Social studies have also discovered that social networking is one of the most preferred ways for women to cope up with their daily stress (Pegher et al. 2006). Thus due to a variety of reasons, cell phone addresses women’s social needs.
The research revealed that cell phones of MW save their long-distance walking to medical dispensaries either for their children or for other family members. Respondents also confirm their appointments to work at MGU, using their cell phone, rather than walking long distances to MGU. All physically strenuous activities that are saved by cell phone add to participants’ physiological motives for using cell phone. Overall physiological motives for both MW and UMG could have been higher, if this research had studied the information behavior of physically impaired population.

UMG satisfy higher number of cognitive needs and subjective needs using their cell phone compared to MW. Typically, seeking knowledge from experts, chatting that relaxes one’s mind, fun and entertainment related activities, and even spiritual ones were considered to satisfy cognitive needs. Thus cognitive needs are only individual level needs, which is hard for MW to realize and pursue in their daily routine. Subjective needs can be realized only if person has enough time to think about oneself and pay attention to own information needs. In a typical married woman’s daily life, there are number of high-priority activities such as cooking, cleaning house, taking care of children, keeping husband happy, maintain good relations with in-laws, rather than spending time on realizing individual needs and paying attention to own information needs. Due to this phenomenal socio-cultural context, subjective needs for MW score far low than UMG. Since married women rarely have time to realize and pursue individual information needs, they cannot make use of their cell phone for pursuing individual needs.

With the above mentioned socio-cultural background, MW exhibit stronger passive search type of information-seeking behavior compared to UMG. MW’s passive attention and ongoing search elements are equal in strength, when seeking information using cell phone. UMG actively search and seek information for more number of reasons than MW. English
is used on cell phone of all interviewees. English is another catalyst for bolstering unmarried girls’ efforts to seek and search information, when compared to MW. English acts as a barrier for members from MW, since most of them cannot read and understand it, which inhibits their efforts for using cell phone for actively searching and seeking information. This fact is mainly responsible for keeping disadvantaged women, particularly who are from older generation, away from the digital economy. Digital economy includes socio-economic opportunities opened up due to ICTs. MW do not use SMS in English but prefer Marathi. The source of information determines whether women would trust and make use of information acquired or not. Sixty three percent of participants rely upon information, only if it is received from trustworthy sources; at the same time 27% of the remaining population never relies upon any type of information received passively or searched actively. The following table summarizes the above illustrated differences in the information behavior of MW and UMG, which were found at the end of second phase (See Table 5).

<table>
<thead>
<tr>
<th>#</th>
<th>MW</th>
<th>UMG</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Relies more on passive ways of acquiring information using cell phone</td>
<td>Very active in seeking information using cell phone</td>
</tr>
<tr>
<td>2</td>
<td>Less human barriers in processing and using information acquired through cell phone</td>
<td>High number of human barriers and discouragements, mainly from relatives, for acquiring, processing, and using information through cell phone</td>
</tr>
<tr>
<td>3</td>
<td>English used on cell phones: one of the major reasons for keeping them away from mainstream digital economy</td>
<td>English is not a major barrier in using cell phone</td>
</tr>
<tr>
<td>4</td>
<td>Greater socio-economic and physiological needs satisfied by cell phone</td>
<td>Greater cognitive and subjective needs satisfied by cell phone</td>
</tr>
<tr>
<td>5</td>
<td>Highly practiced <em>passive search</em> type of information-seeking behavior</td>
<td>Very high on <em>ongoing search</em> and <em>active search</em> types of information-seeking behavior</td>
</tr>
</tbody>
</table>
### Table 5: Disparities in the Information Behavior of MW and UMG: Findings from Qualitative Analysis

<table>
<thead>
<tr>
<th></th>
<th>Less individualistic use of cell phone</th>
<th>Highly individualistic use of cell phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Overall low barriers to information processing and use</td>
<td>High barriers to information processing and use</td>
</tr>
</tbody>
</table>

6.6 **Positive and Negative Effects of Using Cell phone**

Disadvantaged women experience both positive and negative effects of cell phones.

One of the most common complaints made by interviewees was about dirty talks they had to face due to calls made by unknown people at anytime of the day. This also created another human barrier for respondents while acquiring, processing, and using information. Some MW complained that their children get distracted due to various games on their cell phone. For some interviewees “free talk-time offers” by cell phone service providers make them worry about children, since those women believe that children waste their time in chatting with their friends and sharing adult video clips with each other, neglecting their studies. An UMG-6 observes the waxing tendency of human beings to rely on technology and less on their own capabilities for carrying out everyday life activities. She illustrates this risk of overreliance on technology using calculator. According to her, for doing even simple mathematical additions, nowadays she finds people using calculator; on the same line she is afraid that cell phone could also make people handicapped in some way.

6.7 **Effectiveness and Efficiency Achieved through Cell phones**

Cell phones change options available to respondents for implementing various daily activities. Same things from the past can be done differently due to the new ICT. Cell phones can integrate number of functional aspects of their lives. Cell phones make their daily life efficient. Respondents reorganized themselves for carrying out daily activities, when
they started using cell phones. For example, an UMG-4, who stitches clothes as a part-time job, can visit her home during lunch time and does not end up losing her customers visiting her shop during the lunch time. She has written her cell phone number on her small shop so that if customers miss her, they can reach her anytime. In another instance, parents allowed their daughter to work in a different village just because they could reach her on cell phone.

Many interviewees mentioned about switching from landline service to cell phone. In some cases, the entire family started using cell phones and abandoned the “old” practice of using landline. New technological invention is likely to be well-received only if it is available at a lower cost, when compared to similar existing technological innovation meeting the same needs (Nimkoff 1957). All women who completely replaced their landline by cell phone did so, to cut cost of their communication expenditures. Thus monopolistic, fixed telephone line service offered by the government is expensive in rural areas compared to competitive mobile telephony offered by the private sector.

6.8 Direct and Derived Effects of Cell phones in a Feedback Loop

Qualitative data analysis suggests that the context of communication and information needs significantly influences the information behavior of disadvantaged women, who own and use cell phones by earning less than a dollar per day in rural India. Effects of any technology on the society do not depend on inherent characteristics of technology but what people do with technology (Mesthene 1970). In particular, social motives, affective needs, and ways in which needs are realized, influence the information behavior of MW and UMG. The identification and satisfaction of basic needs by people always act as significant objectives in their development process (Fors and Marino 2002). Cell phones facilitate the pursuit of social motives, affective needs, and cognitive needs of MW and UMG.
Data suggest that mobile technologies successfully empower disadvantaged women to satisfy their basic communication and information needs in a rural context. Cell phones have also increased women’s expectations from everyday life. The introduction of cell phones in their lives leads to the change in their information behavior which is a direct effect observed due to cell phones. Moreover, this direct effect further leads to the exposure of the cell phone users to various socio-economic opportunities. Disadvantaged women develop a capacity to get advantage of socio-economic opportunities as an outcome of change in their information behavior. Thus for disadvantaged women, socio-economic opportunities are derivative effects of access to cell phones.

Cell phone serves as a powerful ICT for disadvantaged women to explore socio-economic opportunities in a rural context. In the first phase of quantitative data collection, the quest for economic opportunities was recorded by women as the single largest (35%) reason for using cell phone (See Figure 17 above). Economic benefits from cell phones represent derivative effects of the cell phone usage in rural India. Some women use their cell phone to inquire about market rates in urban areas and nearby towns. Their cell phone communication increases their economic status, which illustrates a positive effect of cell phones on the rural economy.

In the second phase, as a result of qualitative data analysis, social opportunities emerged as the most pursued cause for owning and using cell phones by MW and UMG (See Figure 22). Women’s ability to explore socio-economic opportunities is a derivative effect of owning and using cell phone. Typically, the impact of any technological invention continues through many such derivatives. Even in the West, one of the most practiced applications of cell phone is related to social interaction, thereby avoiding social isolation (Lal and Dwivedi 2009). Cell phones empower disadvantaged women for pursuing their
social motives; this gives them opportunity to maintain their social contacts and strengthen social network. Social opportunities that are realized and explored by women in terms of social-networking (e.g. keeping in touch with friends, planning events with them, inquiring about children to their teachers, etc.), family-bonding (e.g., sharing family issues with closed relatives who do not live together), and daily communication with core-family members (e.g. discussing daily matters with family members who live together) are some of the glaring social changes brought by cell phones in their life. Social changes refer to modifications in existing social structures and social processes that occur along with time (Allen 1957). It is also important to note that 95% of respondents do not share their cell phone with anybody else; which demonstrates the transition of cell phones from an item of luxury to personally owned indispensible technology for everyday life.

Socio-economic opportunities reinforce the need of using cell phones among disadvantaged women. The interviews with disadvantaged women suggest that women who were against using cell phone, in fact, not only just started using cell phone, but also replaced their landline by cell phone. Thus after enjoying benefits of various socio-economic opportunities brought by cell phone, their desires to own and use cell phone rose significantly. Many examples were shared during 22 interviews, where even after losing cell phone, women or their family members bought new sets of cell phone; this was mainly due to their dependence on the service provided by cell phone to exploit everyday life socio-economic opportunities. This forms a feedback loop of direct and derivative effects of cell phones for disadvantaged women who own and use cell phones, while earning less than a dollar per day in a rural part of India (See Figure 29).
6.8.1 Type of Socio-economic Benefits

Cell phones have increased the productivity of disadvantaged women from rural India. The technological innovation in the form of cell phone has created new possibilities and opened new avenues for disadvantaged women from rural India. The socio-economic benefits experienced by women due to cell phone, can be categorized into “internal” – the benefits which affect only the users of cell phones, and “external” – the benefits which are enjoyed by other people in users’ lives (Mesthene 1970). Number of cognitive benefits such as feeling relaxed, and sharing emotional stress with close ones, which are experienced by interviewees can be labeled as internal benefits. Majority of married interviewees, who look after their family-run business, share their socio-economic opportunities and subsequent benefits earned through cell phone with their family members. This illustrates external benefits of cell phones in a rural context. Overall, disadvantaged women, who are proactive in making decisions about owning and using cell phones for pursuing their exposure to
socio-economic opportunities, seem to be empowered by cell phone; this has the potential of redistributing the overall wealth and power in the society.

6.9 Value System of Society and Cell phones

Due to the exponential sales of cell phones in rural India, the rural Indian society is experiencing digital revolution, which could lead to the information society with new combinations of value system and communication norms. Technologies have always influenced various characteristic features of any society as well as individual life styles (Schmeikal et al. 1983). Impingement of technologies on everyday life is widely accepted and studied phenomenon. Also, feminist literature proves that women assign very different meanings and values to technologies, when compared to males from similar backgrounds (Wajcman 1991). In the context of the dissertation research, ways in which everyday life information is acquired, processed, and applied largely influence women’s perception of their role and position in the society. Moreover, information and communication via ICTs fundamentally change the existing social and economic relationships (OECD, 1998). The rapid changes brought by cell phones challenge society’s existing value system.

Widespread adoption of cell phones even in rural India is an indication of collective preference of consumers for the ICT. It is important to note that these consumers range from diverse socio-economic strata in socially hierarchical society. It was found in the dissertation that no married woman was discouraged by husband or children. In fact for many married interviewees, the decision of buying cell phone came out of collective preference, e.g., the realization by family about the significance of using cell phone. Whereas, for most unmarried girls, owning and using cell phone was a self-made decision supplemented by their individual motivation.
Women were not encouraged for owning and using cell phones by their neighbors. At the same time, majority of UMG were discouraged by relatives for owning and using cell phone. Thus the phenomenon of collective preference for owning and using cell phones is limited to core-family members and not beyond that. Cell phones have important social consequences than existing awareness of the fact, and the overall readiness to handle consequences. In Bhor, women are supported for using cell phone; however, this social support is based upon the criterion of marital status. Widespread usage of cell phones in a rural context seems to challenge the value system of the society with slowly changing values.

Society often experiences change in its values due to social and cultural changes brought by technological innovations in people’s lives (Mesthene 1970). Cell phones opened up socio-economic opportunities for a sample of disadvantaged women from Bhor. At the same time, the value system of that rural society was also impinged and challenged by cell phones. A widow with cell phone, riding on a bicycle is completely unacceptable to some elements in the rural society; they express their outrage by abusing her on cell phone and by making fun of her, and eventually discouraging her to stop using cell phone. Thus values of that particular social context seem to be changing slowly compared to the information needs of the interviewees and their pursuit in realizing those needs through cell phone.

Social values keep on changing due to continuous impact of technologies on our lives. In the early days of owning cell phone, an unmarried girl (UMG-9) described herself as “crazy” for cell phones. However, after 2 years of its usage, she felt “bored” about the same technology. She explicitly mentioned that this feeling of “boredom” was not due to her 2-year old device but accounted for the need to “carry” her device at all the time for being connected with her social circle. She is looking forward to get rid of this need to carry cell
phone in the future. This could help cell phone manufacturers to come up with better designs for the ICT, addressing customer needs.

Newly emerging ICTs require us to make distinct choices between the value we associate with leisure and the value we see for enhanced socio-economic opportunities (Mesthene 1970). For an unmarried girl (UMG-6), cell phone is a useful device to get various part-time jobs but at the same time the device brings her a feeling of seclusion due to her sharply increased connectivity with the outside world. She said “…I am going away from myself…” The main reason for her emotional state She feels so experienced that she was not able to give enough time to herself. Hence, she decided to switch off mobile for some time of everyday.

6.10 Key Theoretical Contributions by Dissertation Findings

In the original Model, context of information needs was proposed as the first construct. Dissertation findings suggest that in a rural context of studying information behavior using cell phones, “need of communication” emerged as one of the basic needs for a sample population. This research examined an information behavior theory developed in the West, in a rural context from the East. The research findings proposed to modify the context of information needs to the context of communication and information needs. This is a key contribution made by this dissertation towards existing theoretical knowledge-base of information behavior. The research also verified that newly emerged mobile technology accommodates communication and information needs of disadvantaged women from rural India.

The existing theories on gender and information technology (IT) consider gender (Venkatesh and Morris 2000), social context (Lovegrove and Segal 1991), psychological features (Adam et al. 1994), and individual differences (Trauth 2006) as some of the most fundamental criteria for variations observed in adaption of IT by women compared to men.
Essentialists prove that natural biological differences in men and women are carried forward even in their adaption of IT (Marini 1990). Thus from essentialist point of view, biological differences among men and women serve the only criterion responsible for differences in IT adaptation among people. On the other hand, some social theories propose that social construction of IT is inherently incompatible with social identity of women (Balka and Smith 2000, Eriksson et al. 1991). In contrast, individual differences theory of gender and IT (Trauth 2002) focuses on within group differences at individual level for explaining underrepresentation of women in IT careers.

This dissertation research lays the foundation for proposing a new feminist theory on mobile technology adoption based on group differences. With distinct patterns in information behavior between MW and UMG, the research provides quantitative and qualitative empirical evidence for positing a new feminist theory on adoption of mobile technology by women based on their group differences. For the dissertation, such group difference exists due to marital status, a demographic feature of interviewees. The new feminist theory on mobile technologies and women could analyze the relationship between gender and IT from information behavior point of view. Thus forming a set of number of empirical evidences for a future theory is another major theoretical contribution made by this dissertation.

6.11 Applications of Research Findings

Level of applicability of research potentially decides any research’s practical value in the world. The set of research findings and valuable observations from this dissertation are applicable in the public sector, private sector as well as academia. Research could inform policies and strategies for designing, developing, and executing mobile-Government (m-Government) initiatives through mobile devices. In a developing nation like India, where
broadband infrastructure all over the country is far from reach, mobile telephony seems like a feasible solution for delivering government services effectively. Although mobile technologies’ interfaces cannot replace completely, all the user needs satisfied by computer screen, mobile-Governance (m-Governance) could be a beginning to build “all inclusive” digital democracy for the largest democracy in the world. The Indian Government could collaborate with private sector, which has all ready set up infrastructure for mobile telephony in all most all the parts of India. Committed investments, policies, and implementation plans made in the direction of m-Government could definitely take India to mobile-Democracy, where even illiterate citizens could carry out government transactions such as voting, seeking land-record certificates, gathering weather information, purchasing crop seedlings at affordable rates from nearby government owned stores, using sign language, and numbers used on their cell phone.

Potential socio-economic opportunities could be exploited, only when governments design and implement effective policy frameworks relevant to emerging ICTs (OECD, 1998). The dissertation research could inform government’s efforts to design policy framework for m-Government in rural context. Communication and information needs of population in rural area are different from that of urban areas, but there is a little overlap. The dissertation research grounded in a rural context, studying information behavior of disadvantaged population could enhance Government’s efforts to address poverty through mobile technologies, especially in a country with the largest number of citizens living under the poverty line defined by that Government.

Many donors and non-profit organizations are mainstreaming applications of ICTs in their projects (Fors and Moreno 2002). Dollar-aided deployment of ICTs by non-profit organizations, for building sustainable development in developing nations could be guided
by a set of dissertation research findings. Context specific evaluation and selection of ICTs for achieving set of specific objectives could be immensely informed by the dissertation research findings. The quality of project management in terms of resource allocation, division of labor, and setting feasible targets for ICTs deployment efforts, in the context of developing nations could be improved by research findings and observations made in this dissertation study.

Various recent research studies (ITU 2009) prove that digital divide, a phenomenon which captures not just have and have not of access to technologies, but also varying levels of skills required to utilize those technologies, is as pervasive as it used to be at the beginning of this millennium. There exist different types of digital divide such as urban-rural divide, age-based digital divide, education-based digital divide, race-based digital divide, geographical digital divide and gender digital divide. The dissertation research findings could be applied to understand gender digital divide in the context of cell phones in rural India. The findings emphasize the role of context as the major controlling factor for women, who adopt newly introduced options by cell phones. Direct and derivative effects in the feedback loop (See Figure 29 above) demonstrate the way in which socio-economic opportunities reinforce the need to rely on cell phones for respondents in a rural context. Marital status, social motives, cognitive needs, physiological needs, and affective needs control the information behavior of respondents. The research findings lead us to believe that unless women undergo changes in their information behavior, they cannot apply their cell phone to experience socio-economic development.

Research and development division of many cell phone manufacturers heavily invest in social science research aimed towards finding out information needs and information behavior of various types of users such as youth, disadvantaged populations, elderly users,
academics, engineers, health sector professionals, and alike. The dissertation research can be applied for coming up with better, user-centered cell phone designs and interfaces to serve segments of users in better ways in the future. This sub-area is also known as human computer interaction (HCI), where disadvantaged populations from developing nations represent human aspect, and computer aspect is represented by cell phone. Unexplored markets in developing nations can be better explored with a thorough background study of potential consumers’ information needs and relevant information behavior. The study of users’ information behavior could inform mobile manufacturers about their potential consumers and current trends in the cell phone market. The dissertation research could also help cell phones manufacturers for developing effective marketing strategies for efficient penetration of mobile devices in the colossal markets of developing nations.

The research found that socio-economic opportunities reinforce the need of using cell phones among disadvantaged women from a rural context in a developing nation. Socio-economic opportunities also influence the overall information behavior of respondents, while owning and using cell phones. Applications of this finding would be of immense use to cell phone manufacturers and public sector organizations. For instance, mobile manufacturers may not overlook characteristics features of a socio-economic context, before applying their marketing strategies to the potential markets located in that particular socio-economic context; or public sector organizations may need to study socio-economic context before introducing any specific type of ICTs, while implementing socio-economic initiatives in a particular context.

6.12 Limitations of the Research

The dissertation research does not claim to generalize findings from this dissertation, in fact, it is an attempt to study a specific rural context with reference to disadvantaged
women who own and use cell phones, earning less than a dollar per day. Social settings are inherently dynamic in nature and can never be frozen. Since this dissertation research is a snapshot taken in 2009, it is hard to predict similar results for the same social settings in the future.

Variation in time period for owning and using cell phones by disadvantaged women could threaten the reliability of findings based upon disadvantaged women’s experiences scattered over a range of period. Sharing personal stories of owning and using cell phones, with a stranger male from a higher caste, living in the U.S. would have definitely brought restrictions on women’s communication. Interviews that lasted less than expected duration indicate some of the above mentioned constraints for 22 interviews.

Meanings of words that can be interpreted with reference to a particular context and significance of those words in that context are termed as contextual meanings (Brodbeck 1968). Urban-rural contextual gap between the researcher and disadvantaged women and could have led to the misinterpretation of few Marathi words. Although a standard Marathi-English dictionary was used for the translation, meanings could be ambiguous at some instances. Similarly, due to differences in cultural backgrounds, readers might misconstrue interviewees’ stories or miss the greater meaning or significance associated with their experiences; this inevitable drawback is beyond the scope of this dissertation to take care of.

The dissertation research discovered that cell phones change the information behavior of disadvantaged women as a direct effect and socio-economic opportunities experienced by them, and as derived consequence of using cell phone. Impacts on society are often related to broader focus than that of just technological innovation and adoption by the society (Schmeikal et al. 1983). It is also important to note that causes behind any action
could be either in a sequence, or clusters, or in the form of complex network (Miller 1987). The act of owning and using cell phone by disadvantaged women in rural India itself is a consequence of some causes such as women empowerment movements in the region over the last two centuries, Indian Government’s efforts to create competitive markets for cell phones which led to affordable prices for buying and using cell phones by disadvantaged women, and private industries’ initiatives in building infrastructure required to use cell phone. While presenting direct and derivative effects of cell phones on disadvantaged women, the dissertation research did not take into consideration this whole picture, rather the research focused only on the segment of cell phone users and their information behavior with its implications on socio-economic opportunities. Such unexplored network effects of cell phones on the socio-economic development of rural, disadvantaged women create the need to carry out research in many directions. The next chapter delineates the future research that could be undertaken to clarify, and further explore observations and findings made during this dissertation research.
Chapter 7

Reflections on Cultural and Contextual Features

As a result of quantitative data analysis collected in the first phase, 30 MW and 13 UMG emerged as two groups with distinct information behavior, while owning and using cell phones. This chapter describes various obstacles faced during the actual process of conducting interviews of disadvantaged women, and various preparatory steps and precautions followed to analyze qualitative data obtained from their interviews.

Out of 30 MW, only 15 were willing to appear for an interview, whereas, from UMG, 11 respondents had expressed their interest to be interviewed on cell phone, for revealing their journey about owning and using cell phones. The 5th interviewee from MW (MW-5) had refused to appear for an interview earlier, however, when she learnt that other married women from her cohort were willing to be interviewed, she expressed her interest to the RA. MW-5 told the RA that due to social pressure and the confusion such as “what would people think when they come to know that she has talked to a complete stranger located in the U.S.?” she had decided to drop out of the interview process. One of the potential interviewees from UMG, who had expressed her desire to be interviewed, denied later on. Earlier she told the RA that she was busy, but after consistently pursed by the RA, that unmarried girl told that her parents did not want to her appear for any interview on cell phone, hence she could not be interviewed. Finally, 12 members from MW and 10 from UMG were interviewed over cell phone.

7.1 Scheduling Interviews: A Challenge in Itself

The process of conducting interviews in the second phase of data collection involved (i) identifying specific women from MW and UMG who were willing to be interviewed, (ii)
setting up appropriate timings of interviews which was coordinated by the RA, and (iii) finally, conducting phone interviews. The second step of setting up timings for interviews was challenging, in particular, while deciding timings of interviews with MW. Typically, in Bhor, women from MW live with their in-laws and grown-up children. It was very essential for this research to reach MW, when they were free and were under no pressure to answer different open-ended questions related to their experience of owning and using cell phone. With the help of the RA from the same area and background, the researcher identified appropriate time window, when women feel comfortable in talking to a male interviewer, and share their experiences about owning and using cell phone.

With the help of the RA, specific time window was identified for each woman respondent. Following were some of the sample criteria and corresponding time windows, which were located for interviews: in-laws of women were either out of home in afternoons – typically from 3:00 pm to 4:00 pm, or when their children were put to sleep – from 1:00 pm to 3:00 pm, or when other in-laws were asleep in afternoons – typically from 1:00 pm to 3:00 pm, or when grown-up children of women were out of home for work – typically from 8:00 am to 4:00 pm, or when their husbands had gone out for jobs – typically from 9:00 am to 5:00 pm, etc. With the help of the RA, the researcher identified 5:00 pm -7:00 pm as a convenient time-slot for UMG. Most of them preferred to be interviewed outside their house, when they wandered through market areas. To match above mentioned timings in India, the researcher called interviewees early in the morning from the U.S. For example, to meet a phone appointment with an interviewee at 3:00 pm Indian Standard Time (IST), the researcher called at 5:30 am Eastern Standard Time (EST) from the U.S.
Despite having a college degree in Gujarati, a non-regional language in Maharashtra, the 11th interviewee from MW (MW-11) was appearing for the 12th grade examination since she wanted to earn a degree in Marathi, the native language of Maharashtra; hence it went a bit difficult to set up a suitable time window for her; however her enthusiasm for interview overcame this constraint. The precaution of identifying free time for interviewees and setting up appointments with them immensely helped data collection process, especially in opening up participants and acquiring rich information necessary to arrive at some solid conclusions, regarding the linkage between cell phone and its influence on information behavior.

7.2 The Process of Phone Interviews: A Prolonged Phase Full of Obstacles

Due to numerous obstacles, the process of conducting 22 phone interviews lasted for around 55 days. Problems faced during this interview process were of two types—technical problem and human-created obstacles. Some of the technical problems were mainly related to getting connected with women in rural India, and drop of calls due to weak phone signals network in certain pockets of Bhor. One potential interviewee could not be interviewed since her cell phone does not come under strong signal network area in Bhor. She lives at the bottom of a mountain, where her cell phone does not receive enough signal all the time. For 4 weeks whenever the researcher called the 10th interviewee from MW (MW-10), he always heard the following message: “The Idea number that you are trying to reach is out of reach, please try again later, good bye!” Due to weak mobile signal network, typically, a caller receives this kind of “out of reach” messages on the cell phone.

Human-created problems were either due to interviewees themselves or due to their husband, father, children, or any other in-laws (for women from MW). The 7th and 12th interviewees from MW (MW-7 and MW-12 respectively) had a misunderstanding that their
monthly bills of cell phones increase, if they keep their cell phone “ON” all the time. Hence, they used to keep their cell phones switched off, and switch them on, only when they wish to call somebody. Whenever the researcher used to call MW-7 and MW-12, he used to hear: “this mobile is switched off, please try again later, goodbye”. After conveying this hurdle to the RA, she personally met MW-7 and MW-12, recognized the problem, and advised both of them on their wrong information. The 4th interviewee from MW (MW-4) had not paid her monthly bill on time, and hence her connection was disconnected immediately by the service provider. Whenever the researcher used to call MW-4, he always used to come across a message “calls to this mobile are blocked”. Later on the RA arranged for an alternative number to interview MW-4. The 10th interviewee from MW (MW-10) had forgotten that she had filled in a survey, regarding her experience on using cell phones. When the researcher called her, she clearly refused to recognize him, his survey, and even the RA; and handed over her cell phone to her husband. After explaining all the background information and other details of the research, her husband asked the researcher to call back after 5 minutes. After 15 minutes, when the researcher called her, she apologized and said, “I am sorry. I completely forgot that I had filled in a survey month ago. I am ready for the interview!”

In a standard interview conversation, the researcher used to refresh his interviewees with information about himself, the purpose, and significance of research, surveys that participants had filled in a month ago, and the applications of the research. Before each call made to all the interviewees, the RA took their signed consent, and paid $0.5 to make sure that they remain committed for the interview. After calling the 3rd interviewee from UMG (UMG-3), the researcher refreshed her with all the above mentioned information. She did not respond so he asked her whether she was paid by the RA. And to researcher’s great surprise UMG-3 said, “I do not recognize any such person.” The researcher called the RA
immediately to find out the details on UMG-3 case. Later on the RA went to meet UMG-3 personally and she found out that the interviewee lied, since UMG-3’s father was around, who was against an idea of UMG-3 being interviewed by an unknown person located in the U.S. Later on they set up another appropriate timing for interviewing UMG-3.

Similar incidence happened with the 9th interviewee from UMG (UMG-9). After setting up an appointment with her, when the researcher called her for the first time, he gave her a quick refresher as usual, but she said “I need to go out now, I am busy.” When he asked her about the next time he could call her, she replied “I do not know any such phone interview. I am busy.” The researcher asked her whether the RA contacted her or not and she said “I do not know any such person.” Due to my similar experience with UMG-3 earlier, by now he understood that there must be someone around her who would not like her to talk to me. He told UMG-9 that he would call later and hung up. Later she told that her father was at home, who was opposing her to give any such interview with a stranger from a higher caste. Eventually, after 2 weeks, once she lied to her father that she was going out to a friend’s place and she left her home. While walking on a street in Bhor, she was interviewed by the researcher. However, there was a lot of disturbance caused by gusty wind and traffic in the background of the phone conversation.

There were several incidences in this interview process where the researcher was questioned mainly by husband or father of interviewees, mostly out of concern and/or insecurity. Concerns and/or worries of husbands reflected through their cross-questioning with him, which were mostly due to facts that he was from upper-caste, plus they had never seen him before or talked to him before, and importantly he was calling from the U.S. For a variety of reasons, there seemed to be a lot of anger about the U.S. among some people.
This was also confirmed by the RA, who experienced a bitter conversation with a family of a potential interviewee. Family members of that potential interviewee said: “Why are you working for the U.S.? Don’t you earn enough here? We do not want to release our information to them.” The RA demonstrated an exemplary courage in such situations. She continued with her assignment despite such bitter experiences. At the same time, the researcher was also informed by the RA that there is a lot of curiosity and attraction about the U.S. among children, which eased our communication with those children’s mothers.

When the researcher called the 5th interviewee from UMG (UMG-5), even after explaining who he was, what did he do, the purpose of the research, and the role of women’s responses in this research, father of UMG-5 misconstrued that he was a salesman who was trying to sell cell phones. To researcher’s great surprise, he hung up on the researcher. Afterwards, when the researcher talked to UMG-5, she was embarrassed for what her father did it to the researcher.

Alternative cell phone numbers were used to conduct interviews of the 6th and the 9th interviewees from MW. The 6th interviewee from MW (MW-6) had lost her cell phone, and neither the RA nor the researchers were aware about it. After trying to reach her for almost a week, the researcher requested the RA to meet MW-6 personally. Then it was discovered that she had given her cell phone to her son who had lost it. In order to conduct her interview, the researcher decided to send RA at MW-6’s home in a suitable time window so that the researcher could conduct her interview. MW-9 had given her cell phone to her husband who was recently sent to a local jail due to his fraudulent activities in a local cooperative bank. Once again the RA helped the researcher in finding this fact out, and finally, MW-9 was interviewed on her daughter’s cell phone. MW-9 told the RA that her
husband attended phone calls received only from some specific numbers that he recognized. Hence the researcher never got any response on her cell phone.

Although women owned their cell phone and paid for monthly bills of their cell phone, their husband still had a lot of control over women’s access to their cell phone. MW-11 was away from home due to summer holidays. She had taken her children to a nearby city, where her relatives live. It seems that her cell phone was not with her during that time. Whenever the researcher called on her cell phone, her husband picked up her cell phone. When the researcher asked him about why she did not take her cell phone with her, her husband rudely said, “…because I did not allow” and he hung up. Hence, it was not possible to reach her for almost 3 weeks. After returning back from children’s summer holidays, MW-11 contacted MGU for work, and that’s when the RA informed the researcher that MW-11 is back in Bhor.

Despite cell phones being owned by women, their husband and in-laws monitor and control their usage of cell phone. When the researcher called the 4th interviewee from MW (MW-4) and the 11th interviewee from MW (MW-11), their in-laws picked up his calls, and did not pass on their cell phones to the interviewees, until the researcher satisfactorily explained the purpose and significance of the research, and role of interviewees in the research. In general, husbands asked the researcher several questions about authenticity of phone interviews, his identity, and the ways in which information released by their wives would be used. All though toning of those husbands was arrogant, probably there was also a concern about their wives and their communication with a completely unknown person from higher cast, who claims to be in the U.S. The researcher made sure to remain polite and focused all throughout during phone interrogations made by those husbands. The
researcher’s satisfactory answers to their questions gained enough confidence in them for the researcher and that’s why they allowed their wives to talk to the researcher.

Male belonging to the family of some interviewees either interrupted the interview process or kept watch on their conversations with the researcher. In case of MW-7, when the interview was half-way through, her son came and interrupted the interview process. He came and asked “Who is calling?” and “Why is he calling you?” Immediately, MW-7’s voice tone changed for the conversation, she froze and started giving only short answers. She requested the researcher to wrap up the whole thing as early as possible. In another instance, husband of MW-12 was sitting close to her during the whole interview process. When the researcher asked her about cell phone details, within a fraction of a second, her husband started answering questions. The researcher did not even have to repeat the question. It appeared that she was not aware of cell phone model name and company name (manufacturer) of her own cell phone.

Responsibilities of women and their ongoing activities during interviews created series of obstacles in the process. MW-6 had a grandson with her when she was being interviewed. She was babysitting her grandson. She could not answer all open-ended questions freely, because by the time 3rd question was asked, her grandson had started crying, and she was lulling him, while sharing her experiences of owning and using cell phones. When the researcher called MW-7 for seeking her interview, she could not talk to him for the first time due to some ongoing get-together at her home. Despite setting up an appointment with MW-7, she could not talk to the researcher due to her obligations with her family.
Chapter 8

Future Research

This chapter is based upon various observations made during the background study for the dissertation research, literature review, designing research framework, data collection, and data analysis process. After referring to hundreds of resources for this dissertation, the researcher finds the existing body of research on ICTs and socio-economic opportunities, as just a tip of an iceberg. There are still a number of social, political, policy, legal, cultural, technological, communication, information and data related dimensions that need to be realized, studied, explored, and integrated, before applying emerging technological solutions towards the welfare of more than 6 billion citizens of our planet. The following sub-sections focus on future research ideas, different ways of analyzing existing data, and exploring applications of mobile technologies for the benefit of various segments in the society.

8.1 Pattern matching & clustering: A bottom-up data analysis approach

The dissertation analyzed qualitative data gathered in the second phase using theory-driven, content analysis. This type of data analysis approach compares data collected in field with codes identified from the existing theories. The dissertation followed top-down approach of qualitative data analysis, where codes derived from theories decide the degrees to which data reports for constructs from theories. However, in the future, interviews of disadvantaged participants could be coded using emergent coding technique, without referring to any codebook or pre-existing theories. Translated text of interviews can be coded using line by line coding technique. Codes could be formed in the primary round of coding, patterns among codes could be examined in the second round of coding, and finally, clusters of codes and their inter-relationships could be derived in the final round [See Appendix K]. Thus in the future, bottom-up qualitative analysis of participants’ interviews
could lead to clusters of codes and inter-relationships among them. These clusters and patterns could be further assembled to derive a model on information behavior in the context of cell phones and disadvantaged women from a developing nation’s context.

The above proposed qualitative data analysis is demonstrated by hand-coding interview transcripts, and allowing those codes to form clusters. Such naturally formed clusters depict the picture of context in which information needs of respondents are realized. The bottom-up qualitative data analysis discovered social, economic, personal, and information and communication contexts as the key contexts in which disadvantaged women realize their information needs [See Appendix L]. This bottom-up qualitative data analysis technique could be further applied for understanding other facets of information behavior as well.

8.2 Is Cell phone a Male-dominated Technology?

Men’s monopoly over various technologies plays an important source of their power over women, at the same time women’s lack of technological skills is a significant component in their reliance on men (Wajcman 1991). Husband, sons, brothers, and uncles often encouraged members from MW and UMG to own and use cell phones. In many instances, women from both the groups mentioned about seeking help from some male in their family, when they encountered some sort of problem regarding their cell phone. In addition, almost no female interviewee, with an exception of one, could ever tell the researcher any technical specifications of their cell phone, which they were using on an average for 13 months. Such observations unfold strong correlation between mobile technologies and masculinity in Bhor.

During the interview process, after calling on numbers provided by interviewees, sometimes calls were answered by women other than interviewees, however they never
asked the researcher any question on reasons for calling interviewees; but this was not the case with male who answered calls. All male who picked up calls made sure to ask the researcher about the purpose of call, significance of research, and other details. Very rarely, any married interviewee could ever tell the researcher about any discouragement caused by any male in family, when MW decided to own cell phone, and started using their device. A widow interviewee mentioned about people who intentionally call her to abuse her, to make fun of her, and to prevent her from using cell phone. An ethnographic approach of “living” in the same context as that of disadvantaged women could be adopted for exploring more in this direction.

In the future, it could be explored whether mobile technologies are fundamentally patriarchal or men’s social status in a male-dominated society continues its dominance even in the case of mobile technologies. Theories proposing male domination on ICTs could be examined for various hypotheses based on the above mentioned observations from the dissertation research. New ICTs evolve, building upon old technologies. Social scientists have proven that the majority of technologies in the past have been male-dominated, in addition, studies also claim that irrespective of definitions for masculinity, they all project women as incompatible for technological pursuits (Wajcman 1991). On the same line, it is also important to define features of mobile technologies that could make them male-dominated. The future research could explore research questions – “what features of mobile technologies are not female-friendly?” and “how could mobile technologies be made more gender specific?”

The gender division of labor in technology manufacturing industries is seen as one of the most probable causes for the production of male-dominated technologies. Thus gender
division of labor within mobile technology manufacturing industries could reflect in designs and interfaces of mobile technologies. To demystify this probability, the secondary research question from the future research could inquire if “mobile technologies represent technologies designed for male by male, or not?”

8.3 The Role of Cell phones in Shaping Social Status

The dissertation presented socio-economic opportunities as derivate effects of owning and using cell phones. In the future, it might be interesting to study whether introduction and usage of cell phones have improved the social status of disadvantaged women in India. This research on social empowerment of disadvantaged women due to mobile technologies will be of great significance, particularly in the Indian context, where there exists a very rigid and hierarchical social system. The secondary research questions could be – “how does economic empowerment achieved using mobile technologies translate into social empowerment of disadvantaged women from a rural part of India?” and “how do mobile technologies facilitate disadvantaged women from rural India to overcome negative stereotypes in the society?”

8.4 Technology Leapfrogging in Rural India and Social Changes

Cell phone is the fastest growing ICT, especially in developing nations, demonstrating the phenomenon of technology leapfrogging (Schumpeter 1942, Goldemberg 1998). According to technology leapfrogging phenomenon, developing nations tend to invest more into advanced technologies compared to developed nations who have already invested heavily in old technologies.

Many disadvantaged women in a rural context started using cell phone, when they did not even have fixed line telephone. Such women did not have any reference for owning and using phones in their lives. It would be of value to study the causal relationship between
socio-economic developments with that of cell phone leapfrogging in rural India. The primary research question could be – “is technological leapfrogging a result of socio-economic development in a developing nation context?”

8.5 **Effects of Marketing Strategies, Side-effects, and Rumors about Adopting ICTs**

UMG had personal opinion regarding buying cell phone. They were not influenced by marketing and advertisement efforts of mobile manufacturers. In fact, an unmarried interviewee (UMG-10) perceives telemarketing and marketing done via cell phone as a serious problem, while using cell phones. With reference to cell phone marketing, it would be interesting to see return on investment for marketing efforts of manufacturers on various segments of society.

On the other note, rising awareness about various side-effects of using cell phone in rural India, could pose a threat to the sale of cell phones in that rural context. Damage caused by cell phones to brain was one of the most voiced health-related concerns among participants. Cell phone manufacturers need to do research and come up with some promising action plan against such concerns for using cell phones.

The dissertation research came across interviewees who believed that their cell phone bills go up, if they keep their cell phones in “switched-on” condition. This is obviously a myth. However, there were many interviewees who reported rumors about bursting of Tata cell phones. Such rumors were spread by some people in their surroundings. Rumors could bring down the sales of cell phones in that area. Cell phone manufacturers need to be aware of such potential threats to their sale; they could setup a research to study impacts of rumors, myths, and misconceptions affecting their sales.
8.6 Developing All Inclusive e-Democracy

Currently, in the Indian context, empowerment for its citizens needs to be equated with their ability to participate into decision-making process and experience development at all levels. Mobile technologies offer the most cost-effective solutions to capture, store, process, and communicate information in urban and rural areas. The dissertation research proves that illiterate, low-income, socially-disadvantaged, backward class women, hailing from a rural area can also make use cell phones for attaining their own socio-economic development. Hence, mobile technologies have the potential to serve as the most cost-effective ICT for developing all inclusive electronic-Democracy in the future.

India is at the dawn of mobile-Government (m-Government). Various functional and administrative units of government can offer their services to citizens, marching towards all-inclusive e-Democracy. Governments from various states in India are evaluating possibilities of investing into m-Government. Many national and international non-profits are making use of mobile technologies at experimental level. Microfinance, banking sector, weather forecasting, farmers-related issues, and management of natural resources are some of the potential areas of deploying cell phones to offer government services to citizens. Private sector, public sector, mobile technologies, and management of cell phones for citizens act as different dimensions of mobile-Governance. There is a heavy demand for user-friendly software that run on cell phones in local languages.

In order to introduce all inclusive, socio-economic development to citizens in the future, it would be important to understand changes experienced by citizens in their information behavior due to adaption of cell phones. Although dissertation research was not designed to generalize its results, it could be definitely of immense use to understand context-specific changes in the information behavior of a particular population. Since
learning is a social and collective process, changes in information behavior of citizens are expected to vary according to groups they belong to. Groups could be based on any combinations of demographic features such as age, education, marital status, income level, and so on. Gatekeeper theories could be applied to study changes in existing forms of information acquisition, processing and use, brought by cell phones in the lives of citizens. With this dissertation research as a data point, issues, and needs of various stakeholders could be studied, proposing the context specific mobile technology solutions for effective service delivery for m-Governance in a developing nation like India.
Bibliography


CEMINA (2008). *Strengthening Women’s Leadership in Community Development through Internet Radio in Brazil*, www.cemina.org.br retrieved on Sept. 4, 10:00 EST


differences in the prevalence of diabetes in Italy: The population-based Turin study. *Nutrition, Metabolism and Cardiovascular Diseases.*


Myhr, J., and Nordström, L. (2005). Livelihood Changes Enabled by Mobile Phones, the case of Tanzanian Fishermen, Department of Business Studies, UPPSALA UNIVERSITY.


Ragin, C. C., Nagel, J., and White, P. (2004). *Workshop on scientific foundations of qualitative research*


Solomon, P. (2002). Discovering information in context, Medford, NJ.


Waverman, L. (2007). Mobiles, the digital divide, and Google, A webcast at a seminar in Google, [http://www.youtube.com/watch?v=87-b-fyZZos](http://www.youtube.com/watch?v=87-b-fyZZos) retrieved on April 12, 2007 at 21:09 EST


Appendix A

Facts and Figures of Indian Telecom Industry

Part I

Information and Communication Technologies (ICTs) Statistics

India in the year 2007

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<thead>
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<th>ICT Statistics 2007</th>
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</thead>
<tbody>
<tr>
<td>Population</td>
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<tr>
<td>GDP (U$)</td>
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</tr>
<tr>
<td>Fixed telephone lines per 100 inhab.</td>
<td>3.37</td>
</tr>
<tr>
<td>Mobile cellular subscribers per 100 inhab.</td>
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</tr>
<tr>
<td>Computers per 100 inhab. (2006)</td>
<td>2.76</td>
</tr>
<tr>
<td>Internet users per 100 inhab.</td>
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<tr>
<td>Broadband Internet subscribers per 100 inhab.</td>
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<td>International Internet bandwidth (Mbps) (2006)</td>
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<tr>
<td>Radio sets per 100 inhab. (1997)</td>
<td>11.96</td>
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<tr>
<td>TV sets per 100 inhab. (2005)</td>
<td>13.70</td>
</tr>
<tr>
<td>% population covered by mobile signal (2006)</td>
<td>60.90</td>
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Part II

Subscriber Base (in Million) of Mobile (GSM and CDMA) Services from March, 2003 to March, 2007

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<tr>
<td>Bharti</td>
<td>3.07</td>
<td>6.5</td>
<td>10.98</td>
<td>19.58</td>
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<td>BSNL</td>
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<td>5.53</td>
<td>9.9</td>
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<td>Reliance</td>
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<td>7.8</td>
<td>15.36</td>
<td>26.44</td>
<td>72.14 %</td>
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<td>Tata</td>
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<td>4.85</td>
<td>16.02</td>
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<td>7.37</td>
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<td>Aircel</td>
<td>0.73</td>
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<td>Spice</td>
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<td>0.06</td>
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<td>0.03</td>
<td>0.03</td>
<td>0.03</td>
<td>0.10</td>
<td>233.33 %</td>
</tr>
<tr>
<td><strong>Total</strong></td>
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<td><strong>33.69</strong></td>
<td><strong>52.23</strong></td>
<td><strong>90.14</strong></td>
<td><strong>165.11</strong> *</td>
<td><strong>83.17 %</strong></td>
</tr>
</tbody>
</table>

Source: TRAI 2007
Part III

Private* Operator's Subscriber Base (1998-2007)

* Except BSNL and MTNL rest all 10 licensed service providers are counted as private operators in India.
### Appendix B

#### Data Planning Table

<table>
<thead>
<tr>
<th>#</th>
<th>Constructs from the Model</th>
<th>Index</th>
<th>Variables/ Coding Schema Identified for Each Construct</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Context of Information Needs</td>
<td>1</td>
<td>&quot;Need&quot; is a subjective experience that occurs only in the mind of a person in need</td>
</tr>
<tr>
<td></td>
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<td>2</td>
<td>Ways in which one discovers/ realizes information needs</td>
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<td></td>
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<td>3</td>
<td>Types of Needs based on Motives behind Need of Information</td>
</tr>
<tr>
<td></td>
<td>a</td>
<td></td>
<td>Unlearned motives: including curiosity and sensory stimulation</td>
</tr>
<tr>
<td></td>
<td>b</td>
<td></td>
<td>Social motives: the desire for affiliation, approval or status, or aggression</td>
</tr>
<tr>
<td></td>
<td>c</td>
<td></td>
<td>Physiological: for example, hunger and thirst</td>
</tr>
<tr>
<td></td>
<td>d</td>
<td></td>
<td>Affective Needs</td>
</tr>
<tr>
<td></td>
<td>i</td>
<td></td>
<td>Diversion: escapism, emotional release</td>
</tr>
<tr>
<td></td>
<td>ii</td>
<td></td>
<td>Personal relationships: companionship, social utility</td>
</tr>
<tr>
<td></td>
<td>iii</td>
<td></td>
<td>Personal identity: comparison with life; reality exploration; value reinforcement</td>
</tr>
<tr>
<td></td>
<td>e</td>
<td></td>
<td>Cognitive Needs</td>
</tr>
<tr>
<td></td>
<td>i</td>
<td></td>
<td>need for new information</td>
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<tr>
<td></td>
<td>ii</td>
<td></td>
<td>need to elucidate the information held</td>
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<tr>
<td></td>
<td>iii</td>
<td></td>
<td>need to confirm information held</td>
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<tr>
<td></td>
<td>iv</td>
<td></td>
<td>need to elucidate beliefs and values held</td>
</tr>
<tr>
<td></td>
<td>v</td>
<td></td>
<td>need to confirm beliefs and values held</td>
</tr>
<tr>
<td>2</td>
<td>Activating Mechanisms</td>
<td>4</td>
<td>Stress: a relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and as endangering his or her well-being</td>
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<tr>
<td></td>
<td></td>
<td>a</td>
<td>Attention (vigilance): Orientation towards the threat of the threat</td>
</tr>
<tr>
<td></td>
<td>Stress/Coping Theory</td>
<td>5</td>
<td>Coping: cognitive and behavioral effects to master, reduce or tolerate the internal and external demands that are created by stressful situations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>a</td>
<td>Cognitive avoidance: turning attention away from the threat</td>
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<tr>
<td></td>
<td>Self-efficacy</td>
<td>6</td>
<td>Strength of people's conviction that one can easily execute the behavior required to produce outcome</td>
</tr>
<tr>
<td></td>
<td></td>
<td>a</td>
<td>Self-efficacy will affect how long someone persists in an action and how much effort he or she puts into the action</td>
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<td></td>
<td></td>
<td>7</td>
<td>Four ways to test Self-efficacy</td>
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<tr>
<td></td>
<td></td>
<td>a</td>
<td>Performance accomplishments: carrying out the actions oneself</td>
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<td></td>
<td></td>
<td>b</td>
<td>Vicarious experience: learning from others</td>
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<td></td>
<td></td>
<td>c</td>
<td>Verbal persuasion: which may include self-instruction</td>
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<tr>
<td></td>
<td></td>
<td>d</td>
<td>Physiological states: particularly emotional arousal</td>
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<td></td>
<td>Risk-reward Theory</td>
<td>8</td>
<td>Types of risks associated with risk-reward theory</td>
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<tr>
<td></td>
<td></td>
<td>a</td>
<td>Financial risk: is the product affordable, or should a cheaper product be found?</td>
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<td></td>
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<td>b</td>
<td>Physical risk: is the product hazardous to the individual or his property?</td>
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<tr>
<td>c</td>
<td>Performance risk: concerning the probability of a product performing to an accepted standard</td>
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<tr>
<td>d</td>
<td>Social risk: will the product impress friends and colleagues?</td>
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<tr>
<td>e</td>
<td>Ego risk: will the product improve the person's state of happiness? (Perhaps &quot;self-esteem&quot; might be substituted for happiness).</td>
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<td>f</td>
<td>Safety risk: How safe is it to use?</td>
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<td>g</td>
<td>Time/convenience loss risk</td>
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<td>9</td>
<td>Degree of information that will be sought by users depends upon level of perceived risk</td>
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<tr>
<td>a</td>
<td>High risk is associated with high reward--if only the reward of diminishing the risk</td>
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<td>b</td>
<td>When choice alternatives are similar, search effort will increase in an effort to reduce uncertainty</td>
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<td>3</td>
<td>Intervening Variables</td>
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<tr>
<td>Psychological</td>
<td>10</td>
<td>Any types of conflicting cognitive ideas that confuse person</td>
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<td>11</td>
<td>Any attempts to prove or disprove values or beliefs regarding new information</td>
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<tr>
<td>Demographic</td>
<td>12</td>
<td>Age: Possibility of lesser information or lesser access to information sources due to declining age</td>
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<td>13</td>
<td>Gender: Is it a male dominated or female dominated phenomenon or gender neutral?</td>
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<tr>
<td>a</td>
<td>Is women's any type of traditional role related to this?</td>
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<tr>
<td>14</td>
<td>Does 'having children' play any role on information behavior?</td>
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<tr>
<td>Role-related or Interpersonal</td>
<td>15</td>
<td>Is information source a person? If yes, interpersonal problems arise</td>
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<tr>
<td></td>
<td>a</td>
<td>Interpersonal interactions required to get access to information and related things act as barriers</td>
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<tr>
<td></td>
<td>b</td>
<td>Established behavior patterns for the members of a social system act as barrier to information</td>
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<td>16</td>
<td></td>
<td>Social Factors</td>
<td></td>
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<tr>
<td></td>
<td>a</td>
<td>Efforts to discredit innovation by elite and established class of society</td>
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<tr>
<td></td>
<td>b</td>
<td>In an organizational setting, internalization of external information sources and use them</td>
<td></td>
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<tr>
<td>Environmental</td>
<td>17</td>
<td>Duration for information-seeking between receiver and donor</td>
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<td>18</td>
<td></td>
<td>Urban vs. Rural (Geography)</td>
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<td>19</td>
<td></td>
<td>Cultural influence on transfer of innovations and information transformations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a</td>
<td>Four Factors Attributed Due to Culture, namely…</td>
<td></td>
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<tr>
<td></td>
<td>b</td>
<td>Power Distance: the acceptance of unequal distribution of power in organizations</td>
<td></td>
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<tr>
<td></td>
<td>c</td>
<td>Uncertainty Avoidance: the extent to which a society feels threatened by uncertain situations and so tends to avoid such situations</td>
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<td></td>
<td>d</td>
<td>Individualism-collectivism</td>
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<td></td>
<td></td>
<td>Masculinity-femininity: prevalence of masculine values of materials things</td>
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<tr>
<td>Source Characteristics</td>
<td>20</td>
<td>Access: Availability of information source and Degree of ease for accessing information</td>
<td></td>
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<tr>
<td>21</td>
<td></td>
<td>Credibility: Reliability for quality and accuracy of information</td>
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<tr>
<td>22</td>
<td>Publicity: Degree of publicity of a product or information source</td>
<td></td>
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</tr>
<tr>
<td>23</td>
<td>Channel of Communication: Mode/type of channel through which information is conveyed/received</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>Interpersonal channels: through inter-personal (one-to-one) communication</td>
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<tr>
<td>Economic Factors 24</td>
<td>Direct economic cost</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>Cost of searching information (about cell phone deals, cell phone features, plans, etc.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>Shopping for just enjoyment and entertainment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Value of time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>People with higher income will end up having higher cost of searching since their time will be more expensive compared to the one who have lower income level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>If choice alternatives are limited then search efforts will be reduced</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational 26</td>
<td>Educational level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>Level of education or knowledge base: Highly knowledgeable people feel lesser NEED of information searching</td>
<td></td>
<td></td>
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<tr>
<td>b</td>
<td>The more knowledgeable a person is, easier it would be for him/her to decode and encode information thereby making further information acquisition process even more easier</td>
<td></td>
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</tr>
<tr>
<td>c</td>
<td>Perception of self knowledge: People tend to seek lesser knowledge of a subject in which they perceive themselves knowledgeable</td>
<td></td>
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</tr>
<tr>
<td>Physiological 27</td>
<td>Physical disabilities may act as barriers to information-seeking and Cognitive characteristics</td>
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<td></td>
</tr>
<tr>
<td>a</td>
<td>Lack of technical knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>Limited vocabulary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>Nervousness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d</td>
<td>Emotional state of mind</td>
<td></td>
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</tr>
</tbody>
</table>

**Selective Exposure** 28

Individuals tend to expose to the ideas in accordance with their…

| a | Interests |
| b | Needs |
| c | Existing attitudes |
| d | Predispositions |
| e | stereotype about information or relevant source |

**Information-Seeking Behavior** 4

**Active Elements** 29

Ongoing Search: where active searching has already established the basic framework of knowledge, ideas, beliefs or values, but where occasional continuing search is carried out to update or expand one's framework

| a | Active Search: where an individual actively seeks out information |

**Passive Elements** 30

Passive Attention: such as listening to the radio or watching television programs, where information acquisition may take place without intentional seeking

| a | Passive Search: signifies those occasions when one type of search (or other behavior) results in the acquisition of information that happens to be relevant to the individual |
Advantages of acquiring and processing information can be measured using three criteria:

|   | Information Processing and Use | 31 |  
|---|-------------------------------|----|---|
|  |                               | a  | Grade                           |
|  |                               | b  | An educational measure          |
|  |                               | c  | Income: total household income   |
|  |                               | 32 | Technical terminology can be barrier in information exchange |
|  |                               | a  | Gathering, acquiring information do not guarantee Processing of it |
|  |                               |    | Processing: incorporated into the users' framework of knowledge, beliefs or values |
|  |                               | 33 | Information used: lead to changes in the user's state of knowledge, behavior, values or beliefs |
Appendix C

Mapping 33 Variables from 5 Constructs of the Revised General Model of Information Behavior onto 5 Clusters

1. Context of Information Needs
   1. Need as a subjective experience
   2. Ways in which needs are experienced
   3. Types of needs

2. Activating Mechanisms
   4. Stress
   5. Coping
   6. Strength of people's conviction
   7. Ways to test self-efficacy
   8. Types of risks
   9. Degree of information sought

3. Intervening Variables
   10. Type of conflicting ideas
   11. Attempt to prove or disprove beliefs
   12. Age
   13. Gender
   14. Role of children
   15. Type of information source
   16. Social factors
   17. Duration for information-seeking
   18. Urban vs. Rural
   19. Cultural Influence
   20. Access
   21. Credibility
   22. Publicity
   23. Channel for Communication
   24. Direct economic cost
   25. Value of Time
   26. Education
   27. Physiological
   28. Individual Exposure

4. Information Seeking
   29. Ongoing Search
   30. Passive Attention

5. Information Processing & Use
   31. Advantages of Information Acquisition and Processing
   32. Technical Terminology
   33. Information Used
Appendix D

CONSENT FORM FOR SURVEYS

(FIRST PHASE of DATA COLLECTION)

**Name of Study:** Mobile Technologies and Disadvantaged Women: A Mixed Methods Study of Information Behavior in a Developing Nation Context

**Name of Principal Investigator:** Devendra Dilip Potnis, Doctoral Candidate, College of Computing and Information, State University of New York, University at Albany

**Faculty Advisor:** Dr. Theresa Pardo, Deputy Director, Center for Technology in Government, State University of New York, University at Albany

**Contact Information:** Devendra Potnis – deven25march@gmail.com, 465 Western Ave, Apt 2R, Albany, NY – 12203
Dr. Theresa Pardo – tpardo@ctg.albany.edu , 187 Wolf Road, Albany, NY – 12205

**Purpose of Research:** This research study will explore the role of cell phones in shaping the information behavior (defined as: active and/or passive ways of seeking and searching information) of financially disadvantaged women, who earn less than $1 per day by working at a domestic business setup in a rural part of India.

“Backward class” (the term defined by Government of India for recognizing socially disadvantaged people in the rigid social hierarchy) women who own and use cell phones and earn less than $1 per day by working at MGU, a domestic business located in Bhor, a village in rural India. Based upon a condition of protecting privacy of women employees and application of collected data strictly for the research purposes, owners and managers of MGU agreed upon identifying “backward class”, cell phone holding women
employees, who have a daily income less than $1. Out of 380 women employees working at MGU, there are 121 “backward class” women employees who not only own cell phones but also use cell phones regularly. One twenty one is the maximum possible size of a sample for studying the information behavior of a disadvantaged population, which owns and uses cell phones.

**Participation in this survey is voluntary.**

**Potential Risks:** The research questionnaire will ask participants about their general experiences about using cell phones. The survey will contain simple demographic questions such as name, education, and age along with few questions on women's experience on using cell phones. Moreover, the participation into surveys or interviews will be completely voluntary. Thus, employment and/or social status of the participating women will not be affected by any means due to questions that will be asked to them. The research does not aim to capture any kind of sensitive information from participants.

**Potential Benefits:** The questionnaires for surveys and interviews will help participants to explicitly realize the value and benefits of cell phone usage. Various choices provided for survey questions might help them to crystallize their viewpoint towards cell phones and technologies in general, in the future. For example, choices provided for reasons to use of cell phones might enlighten them with the variety of purposes for using cell phones more than what they might be using cell phones for.

Through surveys and interviews, participants from “backward class” families will gain a huge dignity and self-respect by sharing their own opinions and experiences with a research based in the U.S. Since, participants hail from a small community, the people in their surrounding will start looking at them with greater respect and the participating women are definitely expected to gain more prestige by being part of this research on cell
Participants are also likely to gain satisfaction by contributing towards research efforts focusing on disadvantaged women from developing nations. They will be thrilled and feel excited to talk to someone from their own country, now located in the U.S. and carrying out research on their experiences of using cell phones. This will give them a dignity and respect in the surrounding social context, especially in their families.

In addition, all the participants will be offered an incentive of cash, which will reinforce the value of their opinions and experiences for using cell phones.

**INSTRUCTIONS for Potential Participants**

1. All the interested participants for group-administered surveys are hereby informed that they have full right to opt out of surveys or drop out of surveys anytime they wish; i.e. if you do not wish to be part of this survey, you have the full right to do so; also after started filling survey, you can quit the survey anytime you wish.

2. Participation in this survey is voluntary.

3. Your employment status or wages at MGU will NOT be affected by any way due to your any decision related to this survey.

4. You will be paid a compensation of 25 cents, irrespective of number of questions you answer.

5. You can skip questions, if you are not comfortable answering them.

6. To receive a compensation of 25 cents, please make sure to submit your...
responses back to your lady manager and administrator of this group survey.

7. Your responses will be kept confidential by sealing your survey responses immediately into envelopes in front of you.

8. Your data will be used strictly for research purposes.

9. If you have any queries anytime, please don’t hesitate to consult your manager. You can take her help anytime while filling in surveys as well.

10. If you have any questions concerning your rights as a research participant that have not been answered by the investigator or if you wish to report any concerns about the study, you may contact the University at Albany Office of Regulatory Research Compliance at 518-442-9050 (toll-free 800-365-9139) or orrc@uamail.albany.edu

Please talk to your manager for clarification on any of the above mentioned instructions.

Please sign below along with your name and today’s date, only if you have understood all of the above mentioned instructions on this consent form and you agree with them.

Your Name: ___________________ ___________________ ___________________
(First Name) (Middle Name) (Last Name)

Date: __________________________ Signature: ______________
### Survey Questions for Quantitative Data

Mapping of Questions to Code Indices and Constructs

<table>
<thead>
<tr>
<th>Q #</th>
<th>Interview Questions</th>
<th>Code Index</th>
</tr>
</thead>
</table>
| 1   | What is your full name?  
    | First Name: ________________________  
    | Last Name: ________________________ |            |
| 2   | What was your age on the last birthday? _______ Years |            |
| 3   | Where do you live? (Complete Address) ___________________________ |            |
| 4   | What is the highest grade exam that you passed? (Education) ____________ | 26, 27, 31 |
| 5   | What is your primary source of income? |            |
| 6   | i. What is your current marital status? | 3 |
|     | a. Married |            |
|     | b. Never Married |            |
c Divorced  
d Other, if any: ________________  

ii If yes, how long have you been married for the most recent marriage?  
a less than a year  
b More than a year but less than 2 years  
c More than 2 years but less than 5 years  
d More than 5 years but less than 10 years  
e More than 10 years but less than 15 years  
f If more than 15 years, please state: _________ Years and _______ Months  

7 What is your average daily income in rupees?  
a Less than Rs. 20  
b More than Rs. 20 But Less than Rs. 50  
c More than Rs. 50 But Less than Rs. 75  
d More than Rs. 75 But Less than Rs. 100  
e More than Rs. 100 But Less than Rs. 200  
f More than Rs. 200  
g Other, if any: ________________  

8 For how many months have you been using cell phone?  
a Below 1 month  
b More than 1 month but lesser than 3 months  
c More than 3 month but lesser than 6 months  
d More than 6 month but lesser than 9 months  
e More than 9 month but lesser than 12 months  
f More than a year but lesser than 1.5 year (18 months)
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<td>g</td>
<td>More than 18 months but lesser than 2 years (24 months)</td>
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<td>h</td>
<td>More than 2 years but lesser than 3 years</td>
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<td>i</td>
<td>More than 3 years but lesser than 4 years</td>
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<td>j</td>
<td>If more than 4 years, please specify: _______ years and ____ months</td>
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9 i How many minutes (time) on an average per day do you talk with others on your mobile Cell-phone for everyday-life information? __________ Hrs. _________ Minutes

  15, 17, 25, 29

ii Who are those people?

  a My husband
  b My children
  c My friends at work
  d My Neighbors
  e Female Relative(s)
  f Male Relative (s)
  g Others, if any: __________

10 i Does anybody try to encourage you from using a cell phone?

  a Yes
  b No
  c I don’t remember

ii If yes, then who are those people?

  a My husband
  b My children
  c My friends at work
  d My Neighbors
e  My Relatives
f  Others, if any: __________

11  i  Does anybody try to discourage your use of a cell phone?
    a  Yes
    b  No
    c  I don’t remember

   ii  If yes, then who are those people?
      a  My husband
      b  My children
      c  My friends at work
      d  My Neighbors
      e  My Relatives
      f  Others, if any: __________

12  What was your level of confidence for using a cell phone?  6, 7
   (On the scale of 1 to 10 with 1 as very weak and 10 as very strong)
   Confidence Level: __________

13  Who made you realize about the NEED for using a cell phone?  1, 2
    a  I realized on my own
    b  My husband
    c  My children
    d  My friends at work
    e  My Neighbors
    f  My Relatives
i Did you experience any kind of stress while using a cell phone for the first time?
   a Yes
   b No
   c Sometimes
   d I Don't Remember
   e Other, if any: __________

ii If yes, what was the level of stress on the scale of 1 to 10 with 1 being the lowest level of stress ever experienced and 10 being the highest level of stress ever experienced?
   Stress Level: __________

15 i At present, do you have any DISCOMFORT using cell phones?
   a Yes
   b No
   c Sometimes

ii If yes, what is the level of discomfort?
   a Very High
   b High
   c Medium
   d Low
   e Very Low

16 i Do you share your cell phone with others?
   a Yes
No

If yes, then please complete the following...
In the last month, I shared my cell phone with Mr./Ms_____________ for ______ times per _______ days. He/she is my __________.

<table>
<thead>
<tr>
<th>Person’s Name</th>
<th>Times Per Days.</th>
<th>Relation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

If yes then, how easily you could get hold of your cell phone while sharing it with above mentioned people?

**How easy it was?**

<table>
<thead>
<tr>
<th>How easy it was?</th>
<th>List of Persons with whom you share your cell phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>a Very easy</td>
<td>________________________________</td>
</tr>
<tr>
<td>b Easy</td>
<td>___________________________________________________</td>
</tr>
<tr>
<td>c Moderate</td>
<td>___________________________________________________</td>
</tr>
<tr>
<td>d Difficult</td>
<td>___________________________________________________</td>
</tr>
<tr>
<td>e Very Difficult</td>
<td>___________________________________________________</td>
</tr>
<tr>
<td>Question</td>
<td>Options</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>----------------------------------------------</td>
</tr>
</tbody>
</table>
| Do you agree that you would have used your cell phones MORE, if you had been younger when you first started using cell phones? | a Strongly Agree  
b Agree  
c Not sure  
d Disagree  
e Strongly Disagree |
| What is the overall level of USAGE of cell phones of women around you, when compared to men? | a Equal  
b Women use lesser than men  
c Men use lesser than women  
d Cannot generalize  
e It depends upon: __________ (specify factors, if any) |
| Do you agree that you would have received more everyday-life information through your cell phone, if you had been living in cities (urban areas)? | a Strongly Agree  
b Agree  
c Not sure  
d Disagree  
e Strongly Disagree |
| Do you know how to use simple message service (SMS)?                     | a Yes  
b No |
<p>| i Do you know how to use simple message service (SMS)?                   |                                             |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ii</td>
<td>Do you use SMS?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iii</td>
<td>What is the language used on your cell phone?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>English</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>Hindi</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>Marathi</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d</td>
<td>Other, if any: ___________________________</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iv</td>
<td>Do you agree that the current language on your cell phone is a barrier to use it more?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>Strongly Agree</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>Agree</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>Not sure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d</td>
<td>Disagree</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e</td>
<td>Strongly Disagree</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

21 Which language would you prefer to have on your cell phone?  
   a  English  
   b  Hindi  
   c  Marathi  
   d  Other, if any: ___________________________

22 i In general, how much can you rely upon information gathered through your cell phone?  
   a  Always  
   b  Never
<table>
<thead>
<tr>
<th></th>
<th>How frequently do you use information received or gathered through your cell phone?</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>Always</td>
</tr>
<tr>
<td>b</td>
<td>Sometimes</td>
</tr>
<tr>
<td>c</td>
<td>Rarely</td>
</tr>
<tr>
<td>d</td>
<td>Never</td>
</tr>
<tr>
<td>e</td>
<td>Other, if any: ___________________________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Do you agree that information received or gathered through your cell phone has increased your knowledge?</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>b</td>
<td>Agree</td>
</tr>
<tr>
<td>c</td>
<td>Not sure</td>
</tr>
<tr>
<td>d</td>
<td>Disagree</td>
</tr>
<tr>
<td>e</td>
<td>Strongly Disagree</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Marketing and Publicity for cell phones affect my decision to use cell phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>b</td>
<td>Agree</td>
</tr>
<tr>
<td>c</td>
<td>Not sure</td>
</tr>
<tr>
<td>d</td>
<td>Disagree</td>
</tr>
<tr>
<td>e</td>
<td>Strongly Disagree</td>
</tr>
</tbody>
</table>
What is the monthly bill for the cell phone that you are using currently?

- Less than Rs. 100 (a)
- More than Rs. 100 but less than Rs. 200 (b)
- More than Rs. 200 but less than Rs. 300 (c)
- More than Rs. 300 but less than Rs. 400 (d)
- More than Rs. 400 but less than Rs. 500 (e)
- More than Rs. 500 (f)

Who pays for it?

- Myself (a)
- My husband (b)
- My children (c)
- My friends at work (d)
- My Neighbors (e)
- Female Relative(s) (f)
- Male Relative(s) (g)
- Others: __________ (h)

Was there any risk (for example, social risk, financial risk, etc.) involved in using cell phone?

- Yes (a)
- No (b)

If yes, please state: ________________

Why do you use your cell phone for?
a For Safety and Security
b Since I am Physically Challenged, Family members gave me one
c For our family business (purchasing seeds for vegetables, weather for agricultural
purposes,
d Share information for current market prices of the items we sell, for example, vegetables,
groceries, utensils, fish, fruits, etc.)
d For my job
e Social status: cell phone as a status symbol or my friends own so I bought
f To earn money by offering a calling service through my cell phone
G For health related purposes (e.g.: pregnancy, disease)
H To keep in touch with immediate family members (e.g.: spouse, parents and children)
I To keep in touch with extended family members (e.g.: uncle, aunt, etc.)
J To keep in touch with friends (e.g.: school friends, college friends, etc.)
K In emergency situations like: ____________________________
L To reduce the need of travel
M Others, if any: _________ (Please state)

29 Does 'having children' play any role on use of cell phone?
i Yes
ii No
If Yes, please explain: ____________________

30 Would you like to be contacted again for a phone interview of approximately 30 minutes?
During this interview, you will be asked to share your experiences with using a cell phone
in more detail.
i Yes
ii No

THANK YOU
Appendix F

CONSENT FORM FOR INTERVIEWS

(SECOND PHASE of DATA COLLECTION)

Name of Study: Mobile Technologies and Disadvantaged Women: A Mixed Methods Study of Information Behavior in a Developing Nation Context

Name of Principal Investigator: Devendra Dilip Potnis, Doctoral Candidate, College of Computing and Information, State University of New York, University at Albany

Faculty Advisor: Dr. Theresa Pardo, Deputy Director, Center for Technology in Government, State University of New York, University at Albany

Contact Information: Devendra Potnis – deven25march@gmail.com, 465 Western Ave, Apt 2R, Albany, NY – 12203
Dr. Theresa Pardo – tpardo@ctg.albany.edu, 187 Wolf Road, Albany, NY – 12205

Purpose of Research: This research study will explore the role of cell phones in shaping the information behavior (defined as: active and/or passive ways of seeking and searching information) of financially disadvantaged women, who earn less than $1 per day by working at a domestic business setup in a rural part of India.

“Backward class” (the term defined by Government of India for recognizing socially disadvantaged people in the rigid social hierarchy) women, who own and use cell phones and earn less than $1 per day by working at MGU, a domestic business located in Bhor. Based upon a condition of protecting privacy of women employees and application of collected data strictly for the research purposes, owners and managers of MGU agreed upon identifying “backward class”, cell phone holding women employees who have a daily income less than $1. Out of 380 women employees working at MGU, there are 121 “backward class” women employees who not only
own cell phones but also use cell phones regularly. One twenty one is the maximum possible size of a sample for studying the information behavior of a disadvantaged population which owns and uses cell phones.

**Participation for interview is voluntary.**

**Potential Risks:** The research questionnaire will ask participants about their general experiences about using cell phones. The survey will contain simple demographic questions such as name, education and, age along with few questions on women's experience on using cell phones. Moreover, the participation into surveys or interviews will be completely voluntary. Thus, employment and/or social status of the participating women will not be affected by any means due to questions that will be asked to them. The research does not aim to capture any kind of sensitive information from participants.

**Potential Benefits:** The questionnaires for surveys and interviews will help participants to explicitly realize the value and benefits of cell phone usage. Various choices provided for survey questions might help them to crystallize their viewpoint towards cell phones and technologies in general, in the future. For example, choices provided for reasons to use of cell phones might enlighten them with the variety of purposes for using cell phones more than what they might be using cell phones for.

Through surveys and interviews, participants from “backward class” families will gain a huge dignity and self-respect by sharing their own opinions and experiences with a research based in the U.S. Since, participants hail from a small community, the people in their surrounding will start looking at them with greater respect and the participating women are definitely expected to gain more prestige by being part of this research on cell phones.

Participants are also likely to gain satisfaction by contributing towards research efforts focusing on disadvantaged women from developing nations. They will be thrilled and feel excited
to talk to someone from their own country, now located in the U.S. and carrying out research on their experiences of using cell phones. This will give them a dignity and respect in the surrounding social context, especially in their families.

In addition, all the participants will be offered an incentive of cash, which will reinforce the value of their opinions and experiences for using cell phones.

**INSTRUCTIONS for Potential Interviewees**

1. All the interested participants for phone interviews are hereby informed that they have full right to opt out of interviews anytime they wish; i.e. if you do not wish to be part of this phone interview, you have the full right to do so; you can quit this phone interview anytime you wish.

2. Participation for interview is voluntary.

3. Your employment status or wages at MGU will NOT be affected by any way due to your any decision related to this phone interview.

4. You will be paid a compensation of 50 cents, irrespective of number of questions you answer during this phone interview. You will be paid 50 cents immediately after this interview.

5. You can ask the interviewer to skip the questions, if you are not comfortable answering them.

6. You will be asked by the interviewer - if you are willing to allow the interviewer to record your conversation with him on the telephone. Please do not hesitate to reply frankly. If you don’t want anybody to record your experience of using cell phones, then say “NO”.
This will not affect your compensation of 50 cents.

7. Your responses will be kept confidential by protecting your phone conversation using a password.

8. Your phone conversation with the interviewer will be used strictly for research purposes.

9. If you have any questions concerning your rights as a research participant that have not been answered by the investigator or if you wish to report any concerns about the study, you may contact the University at Albany Office of Regulatory Research Compliance at 518-442-9050 (toll-free 800-365-9139) or orrc@uamail.albany.edu

Please talk to your manager for clarification on any of the above mentioned instructions.

Please sign below along with your name and today’s date, only if you have understood all of the above mentioned instructions on this consent form and you agree with them.

Your Name: _____________________________ _____________________________ _____________________________
(First Name) (Middle Name) (Last Name)

Date: ________________________________ Signature: __________________________
Appendix G

INTERVIEW QUESTIONS & PROMPTS FOR QUALITATIVE DATA
Mapping of Questions to Code Indices and Constructs

<table>
<thead>
<tr>
<th>Q #</th>
<th>Interview Questions and Prompts</th>
<th>Code Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Why did you start using a cell phone? Any specific incidence, reason?</td>
<td>2, 3</td>
</tr>
<tr>
<td>2</td>
<td>Tell me a few stories about various purposes for which you usually use your cell phone</td>
<td>33</td>
</tr>
<tr>
<td>3</td>
<td>Did you have any problems in the beginning when you started using cell phone?</td>
<td>5, 7</td>
</tr>
<tr>
<td></td>
<td>i  How did you fix those problems?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ii How did you achieve the current level of proficiency for using your cell phone?</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Do you think there are any risks associated with using a cell phone?</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>i  If yes, then what are the different types of risks associated with seeking information through cell phones?</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>In the beginning, was there any type of confusion in your mind regarding using a cell phone?</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Question</td>
<td>Page</td>
</tr>
<tr>
<td>---</td>
<td>--------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>ii</td>
<td>If yes, then please describe them…</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>How did the degree of perceived risk affect your level of cell phone usage?</td>
<td>9</td>
</tr>
<tr>
<td>7 i</td>
<td>Before started using your cell phone, did you have any conflicting beliefs or values associated to cell phones in general, in mind? I am referring to cultural, social, family and personal beliefs and values here…</td>
<td>11, 19, 28</td>
</tr>
<tr>
<td>ii</td>
<td>If yes, please explain…</td>
<td></td>
</tr>
<tr>
<td>8 i</td>
<td>Did your husband, children, relatives, friends or neighbors influence your decision to use a cell phone?</td>
<td>14, 33</td>
</tr>
<tr>
<td>ii</td>
<td>If yes, please explain…</td>
<td></td>
</tr>
<tr>
<td>9 i</td>
<td>Did anybody try to discourage you from using cell phones?</td>
<td>16</td>
</tr>
<tr>
<td>ii</td>
<td>If yes, please explain…</td>
<td></td>
</tr>
<tr>
<td>10 i</td>
<td>Did anybody try to encourage you from using cell phones?</td>
<td>16</td>
</tr>
<tr>
<td>ii</td>
<td>If yes, please explain…</td>
<td></td>
</tr>
<tr>
<td>11 i</td>
<td>With whom do you talk the most?</td>
<td>15, 17, 25, 29</td>
</tr>
<tr>
<td>ii</td>
<td>May I ask why?</td>
<td></td>
</tr>
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<td></td>
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<tr>
<td><strong>12</strong></td>
<td>List the top 3 sources you use to find information in general?</td>
<td>30</td>
</tr>
<tr>
<td><strong>13</strong></td>
<td>i. Is the information you receive through your cell phone usable?</td>
<td>27, 32</td>
</tr>
<tr>
<td></td>
<td>ii. Is the information you received through your cell phone useful?</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>iii. Why or Why Not?</td>
<td></td>
</tr>
</tbody>
</table>
Appendix H

Codebook for “Context of Information Needs”

<table>
<thead>
<tr>
<th>Need as a Subjective Experience &amp; Ways in which Need is Discovered</th>
<th>Types of Information Needs based on Motives</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unlearned Motives</td>
</tr>
<tr>
<td>Ask*</td>
<td>Affect*</td>
</tr>
<tr>
<td>Believ*</td>
<td>Attract*</td>
</tr>
<tr>
<td>Benef*</td>
<td>Curio*</td>
</tr>
<tr>
<td>Convey*</td>
<td>Eager</td>
</tr>
<tr>
<td>Danger*</td>
<td>Influence*</td>
</tr>
<tr>
<td>Desire*</td>
<td>Interest*</td>
</tr>
<tr>
<td>Discover*</td>
<td>Liked</td>
</tr>
<tr>
<td>Family under tension</td>
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</tr>
<tr>
<td>Feel*</td>
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<tr>
<td>Felt*</td>
<td></td>
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<tr>
<td>Find</td>
<td></td>
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<tr>
<td>Fulfil*</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Great convenience</td>
<td>Great value</td>
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<tr>
<td>Great value</td>
<td>Has benefit*</td>
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<tr>
<td>Has benefit*</td>
<td>I am benefit*</td>
</tr>
<tr>
<td>I am benefit*</td>
<td></td>
</tr>
<tr>
<td>I Need*</td>
<td>Family</td>
</tr>
<tr>
<td>Precaution*</td>
<td>Father</td>
</tr>
<tr>
<td>Priva*</td>
<td>Friend*</td>
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<td>Realize*</td>
<td>Gather</td>
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<tr>
<td>Require*</td>
<td>Grandmother</td>
</tr>
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<td>Risk*</td>
<td>Home*</td>
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<tr>
<td>Satisf*</td>
<td>Hostel*</td>
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<tr>
<td>Search*</td>
<td>Husband*</td>
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<tr>
<td>Seek*</td>
<td>In touch with</td>
</tr>
<tr>
<td>Shar*</td>
<td>Inquir*</td>
</tr>
<tr>
<td>Thought</td>
<td>Maintain contact*</td>
</tr>
<tr>
<td>Useful*</td>
<td>Member*</td>
</tr>
<tr>
<td>Utility of mobile</td>
<td>Message*</td>
</tr>
<tr>
<td>Worr*</td>
<td>Mother</td>
</tr>
<tr>
<td>Worry about</td>
<td>Mummy</td>
</tr>
</tbody>
</table>

| Pappa | Teasing | Stitching |
| Parent* | Sister | Suppl* |
| Relati* | Social*Status* | Teacher |
| Relative* | | |
| Teasing | Support* | |
| Sister | Talk to | |
| Social*Status* | Talk with | |
## Appendix I

### Codebook for “Information Processing and Use”

<table>
<thead>
<tr>
<th>Human Barriers to Acquiring, Processing, and Using Information</th>
<th>Technical Barriers to Acquiring, Processing, and Using Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nobody encourage*</td>
<td>Don't understand * English</td>
</tr>
<tr>
<td>I was discouraged</td>
<td>Can't read English</td>
</tr>
<tr>
<td>Discourage*</td>
<td>Don’t use SMS</td>
</tr>
<tr>
<td>No guarantee</td>
<td>Don’t* text*</td>
</tr>
<tr>
<td>Only call</td>
<td>Can’t use SMS</td>
</tr>
<tr>
<td>Only attend*</td>
<td>Don’t know how to use*</td>
</tr>
<tr>
<td>Confus*</td>
<td>Can't read or write</td>
</tr>
<tr>
<td>Only send*</td>
<td>Can’t use voicemail</td>
</tr>
<tr>
<td>Only receive*</td>
<td>Don’t use voicemail</td>
</tr>
<tr>
<td>Only give a call</td>
<td>No range</td>
</tr>
<tr>
<td>Useless information</td>
<td>Low signal</td>
</tr>
<tr>
<td>Can’t use information</td>
<td>Tower is far*</td>
</tr>
<tr>
<td>Cannot use mobile</td>
<td>Technical problem*</td>
</tr>
<tr>
<td>Can't handle</td>
<td>Batter* blast</td>
</tr>
<tr>
<td>Don’t use information</td>
<td>Mobile doesn’t work</td>
</tr>
<tr>
<td>Don't use mobile</td>
<td>Blast</td>
</tr>
<tr>
<td>Don't talk on mobile</td>
<td>Charging problem*</td>
</tr>
<tr>
<td>Don’t get time to talk</td>
<td>Disturbance</td>
</tr>
<tr>
<td>Don't want to talk</td>
<td>Call drop*</td>
</tr>
<tr>
<td>Can’t process</td>
<td>Connections don’t work</td>
</tr>
<tr>
<td>Don’t process</td>
<td>No electricity</td>
</tr>
<tr>
<td>Can’t use completely</td>
<td>Typing is troublesome</td>
</tr>
<tr>
<td>Don’t use completely</td>
<td></td>
</tr>
<tr>
<td>It took me * * to learn</td>
<td></td>
</tr>
<tr>
<td>Use partially</td>
<td></td>
</tr>
<tr>
<td>Understand partially</td>
<td></td>
</tr>
<tr>
<td>I share my mobile</td>
<td></td>
</tr>
<tr>
<td>Risk*</td>
<td></td>
</tr>
<tr>
<td>Scare*</td>
<td></td>
</tr>
<tr>
<td>Don’t understand * phone</td>
<td></td>
</tr>
<tr>
<td>Don’t understand * technical</td>
<td></td>
</tr>
<tr>
<td>Bill*</td>
<td></td>
</tr>
<tr>
<td>High-cost</td>
<td></td>
</tr>
<tr>
<td>Expens*</td>
<td></td>
</tr>
<tr>
<td>Can’t understand, restriction*</td>
<td></td>
</tr>
<tr>
<td>Knew * basics, can’t talk</td>
<td></td>
</tr>
<tr>
<td>Can’t use completely</td>
<td></td>
</tr>
<tr>
<td>Don’t use completely</td>
<td></td>
</tr>
<tr>
<td>It took me * * to learn</td>
<td></td>
</tr>
<tr>
<td>Use partially</td>
<td></td>
</tr>
<tr>
<td>Understand partially</td>
<td></td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
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<td></td>
</tr>
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<td>Scare*</td>
<td></td>
</tr>
<tr>
<td>Don’t understand * phone</td>
<td></td>
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<tr>
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<td></td>
</tr>
<tr>
<td>Bill*</td>
<td></td>
</tr>
<tr>
<td>High-cost</td>
<td></td>
</tr>
<tr>
<td>Expens*</td>
<td></td>
</tr>
<tr>
<td>Can’t understand, restriction*</td>
<td></td>
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<tr>
<td>Knew * basics, can’t talk</td>
<td></td>
</tr>
<tr>
<td>Can’t use completely</td>
<td></td>
</tr>
<tr>
<td>Don’t use completely</td>
<td></td>
</tr>
<tr>
<td>It took me * * to learn</td>
<td></td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>Understand partially</td>
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</tr>
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<td>I share my mobile</td>
<td></td>
</tr>
<tr>
<td>Risk*</td>
<td></td>
</tr>
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<td>Scare*</td>
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<tr>
<td>Don’t understand * phone</td>
<td></td>
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<tr>
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</tr>
<tr>
<td>Bill*</td>
<td></td>
</tr>
<tr>
<td>High-cost</td>
<td></td>
</tr>
<tr>
<td>Expens*</td>
<td></td>
</tr>
<tr>
<td>Can’t understand, restriction*</td>
<td></td>
</tr>
<tr>
<td>Knew * basics, can’t talk</td>
<td></td>
</tr>
<tr>
<td>Can’t use completely</td>
<td></td>
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</tbody>
</table>
## Appendix J

### Codebook for “Information-seeking Behavior”

<table>
<thead>
<tr>
<th>Active Elements</th>
<th>Passive Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ongoing search</strong></td>
<td><strong>Active search</strong></td>
</tr>
<tr>
<td><em>update</em></td>
<td><em>doubt</em></td>
</tr>
<tr>
<td>I acquire*</td>
<td>Access*</td>
</tr>
<tr>
<td>I make calls*</td>
<td>After decid*</td>
</tr>
<tr>
<td>I call*</td>
<td>My choice*</td>
</tr>
<tr>
<td>I dial*</td>
<td>My goal*</td>
</tr>
<tr>
<td>I gather* information</td>
<td>I bought mobile</td>
</tr>
<tr>
<td>I get information</td>
<td>I decid*</td>
</tr>
<tr>
<td>I have been using mobile</td>
<td>I Expect*</td>
</tr>
<tr>
<td>I pay</td>
<td>I Inquire*</td>
</tr>
<tr>
<td>I Search*</td>
<td>I learnt</td>
</tr>
<tr>
<td>I talk*</td>
<td>I Seek*</td>
</tr>
<tr>
<td>I use mobile</td>
<td>I Sought</td>
</tr>
<tr>
<td>I was dial*</td>
<td>I told</td>
</tr>
<tr>
<td>Intention*</td>
<td>My decision*</td>
</tr>
<tr>
<td>Leaving voice message*</td>
<td>My expect*</td>
</tr>
<tr>
<td>Leaving voicemail*</td>
<td>We decide*</td>
</tr>
<tr>
<td>I seek advi*</td>
<td></td>
</tr>
<tr>
<td>I send message*</td>
<td></td>
</tr>
<tr>
<td>To know about</td>
<td></td>
</tr>
<tr>
<td>We need*</td>
<td></td>
</tr>
<tr>
<td>User Guid*</td>
<td></td>
</tr>
<tr>
<td>#</td>
<td>Codes (Categories)</td>
</tr>
<tr>
<td>----</td>
<td>-----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Orders of papad over the mobile</td>
</tr>
<tr>
<td>2</td>
<td>Prepare papad</td>
</tr>
<tr>
<td>3</td>
<td>Sell papad</td>
</tr>
<tr>
<td>4</td>
<td>Deliver papad</td>
</tr>
<tr>
<td>5</td>
<td>Customers pick up orders on their own</td>
</tr>
<tr>
<td>6</td>
<td>A lot of benefits of information gathered through mobile</td>
</tr>
<tr>
<td>7</td>
<td>Getting very useful information on mobile</td>
</tr>
<tr>
<td>8</td>
<td>For all practical purposes information on mobile is useful</td>
</tr>
<tr>
<td>9</td>
<td>I have been benefited a lot by mobile</td>
</tr>
<tr>
<td>9</td>
<td>To know what’s happening with others</td>
</tr>
<tr>
<td>9</td>
<td>Mainly to maintain contact with all, and to be contacted by all</td>
</tr>
<tr>
<td>10</td>
<td>Contacting husband anytime</td>
</tr>
<tr>
<td>11</td>
<td>Reaching teachers of children during exam period</td>
</tr>
<tr>
<td>12</td>
<td>Calling children to ask about their return time from school</td>
</tr>
<tr>
<td>13</td>
<td>I don’t need to walk long-distance</td>
</tr>
<tr>
<td>14</td>
<td>Making urgent calls using mobile</td>
</tr>
<tr>
<td>15</td>
<td>Getting things done fatafat* [a Marathi word for “swiftly”]</td>
</tr>
</tbody>
</table>
| 16 | My husband is a simple driver. Phone is useful to me in finding out about when he would come back home, where is his vehicle, etc. | - Contacting and inquiring husband
- Conveying safety status to family
- Ability to communicate anybody anywhere | Social |
<p>| 17 | Conveying safety and security to worrying family members, while returning late from work | Ability to reach anybody anywhere |  |
| 18 | Mobile is useful for talking with customers | - Facility offered by cell phone while earning income through papad | Economic |
| 19 | No more visiting each home to sell papad |  |  |
| 20 | On one call I can get market rate for goods in different areas | - Mobile for earning profit |  |
| 21 | Due to mobile it becomes easy to contact wholesale shop-men (who are suppliers for her business) in Pune | - Mobile for bringing efficiency in business by contacting suppliers from a distant place | Socio-economic |
| | Children employed at a far place bought mobiles, and started asking their mother to call them from landline, which increased her landline expenses, hence mobile was found as a cheaper solution | - Mobile as an inexpensive communication medium for contacting children |  |
| | Communicating with clients for astrology consultation | - Social contacts for earning income |  |
| | Seeking advice of supervisor, and contacting colleagues at work | - Work-related issues affecting performance at work |  |
| 22 | Ordering goods using mobile | - Financial transactions over cell phone | Economic |
| 23 | Buying goods in Pune on mobile phone |  |  |
| 24 | To replace landline which was high-cost by | - Cost-cutting on communication expenses |  |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mobile which is low-cost</td>
<td></td>
<td>Social</td>
</tr>
<tr>
<td>25</td>
<td>Anytime contact by patients for seeking help and guidance</td>
<td>- Ability to help and guide others</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Children living at a distance place, make it necessary to use mobile</td>
<td>- Family needs</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Contact made by son after their accident</td>
<td>- Communication in emergency with husband and children</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Condolences to friends over the phone</td>
<td>- Emotional support to friends</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Teasing and making fun of friends, calling from different numbers</td>
<td>- Enjoying friendship over the phone (self-entertainment)</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Everywhere people use mobile for information</td>
<td>- Basic need of communication and information sharing</td>
<td>Information and Communication</td>
</tr>
<tr>
<td>29</td>
<td>Conveying and receiving messages</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Using mobile only for needful communication and not for entertainment</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Seeking expertise from knowledgeable, expert people in certain fields</td>
<td>- Need for seeking knowledge</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>I use phone for this and children had house *[in this context, this Marathi word means enthusiasm] as well. In other children's home they have mobile, so we should also have one. So their father has bought mobiles to all the 3 children.</td>
<td>- Mobile for satisfying personal desire to match “status” with others</td>
<td>Personal</td>
</tr>
<tr>
<td>31</td>
<td>I did not have any other tool (other than mobile) to do that earlier (to gather information earlier)</td>
<td>- Mobile as a great personal facility since mobile is the only way for gathering information</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>I can get any help I need using mobile</td>
<td>- Feeling of being connected with the outside world for seeking help</td>
<td></td>
</tr>
<tr>
<td></td>
<td>To talk personal things</td>
<td>- To discuss personal issues</td>
<td></td>
</tr>
</tbody>
</table>
## Appendix L

### Context of Information Needs Using Bottom-up Data Analysis

#### Social Context

* Social-networking (to touch-base with friends, planning with friends, inquiring about children with their teachers, etc.)
* Family-bonding (to share family issues with closed relatives who do not live with you)
* Core-family daily communication (to talk daily matters with family members who live)

#### Economic Context

* To earn profit in business
* For better job prospects
* For better financial opportunities
* Cost-cutting on landline phones (mobile as a cost-effective communication medium)
* Conserving resources for running daily errands
* Advertisement campaigns by mobile manufacturers and service providers
* Free talk time (For example, Tata mobile holders get to talk free with other Tata mobile holders)

#### Personal Context

* Privacy (mobile is a mode of exercising privacy through private talks)
* Freedom (mobile is a mode of experiencing independence)
* Safety and security (mobile is used to ensure personal safety and security)
* Personal interest with curiosity for cell phones
* A solution to walking long distances in remote areas for…
  - communicating with others
  - medical conditions
* Mobile for seeking emotional support
* Personal entertainment (mobile for playing games, fun, leisure, etc.)

#### Information & Communication Context

* Mobile as an effective and efficient tool for handicapped to communicate with the outside world
* Mobile for ______ Information
  - Sharing
  - Discussing
  - Gathering
  - Storing
* Mobile for communication in emergency situations
* Mobile for seeking guidance, knowledge and expertise
* Mobile as a substitute to face-to-face communications
Glossary

1. **ICTs**
   - Information and Communication Technologies
   In the context of this dissertation, cell phones are sometimes referred as mobile technologies.

2. **Disadvantaged Populations**
   - The classic literature of Economics defines people’s *disadvantaged* status, in terms of their…
     - Income and/or
     - Health and/or
     - Education


For the purpose of this dissertation, women experiencing the state of disadvantaged due to *income* are considered.

3. **Information Behavior**
   - “…the totality of human behavior in relation to sources and channels of information, including both active and passive information-seeking, and information use…”
   - It includes face-to-face communication with others, as well as the passive reception of information as in,
   - For example, watching TV advertisements, without any intention to act on the information given


4. **“Backward Class”**
   - India is a nation with very rigid and structured cast-based social hierarchy.
- Historically, the overwhelming majority of the population has been socially, economically, educationally, and politically oppressed. After the nation's independence in 1947, such classes of oppressed populations are being referred as “Backward Class” for the government purposes.

- Schedule Caste (SC), Schedules Tribes (ST) and Other Backward Classes (OBC) form currently defined bracket of “backward Class”.


5. Everyday-Life Information Behavior

- Everyday-life information behavior is defined (by information science researchers) in the context of day-to-day activities. Information behavior demonstrated by users for carrying out daily activities forms the core of everyday-life information behavior concept.


- Everyday-life information behavior is alternatively also known as everyday information behavior. It predominantly consists of understanding, conceptualizing, and theorizing everyday information needs and information-seeking of individuals from users' perspectives.


- In a research study for everyday-life information behavior of twins, everyday-life information behavior has been defined as all types of information-seeking behaviors demonstrated by twins excluding the one in school context.


6. Tele-density

- Tele-density is defined as the number of telephones in use for every 100 individuals living within an area.

- A tele-density greater than 100 means there are more telephones than people. Third-world countries may have a tele-density of less than 10.