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Abstract

During the last decade, there has been tremendous growth in mobile penetration in many countries across the globe and most interestingly in a number of developing countries. On the other hand around, half of the world's population is deprived of banking and financial services. This paper is based on a study that was aimed to identify drivers and inhibitors for adoption of MFS among the rural under-banked population and to compare the same with that of the existing studies. During the study, an extensive review of literature was conducted to identify the factors that were studied and found significantly affecting the adoption of mobile financial services. This was followed by an exploratory qualitative research conducted among the rural under-banked population of three distinct states in India. The findings of the study indicate that the demand for banking and financial services and the amount of hardships faced in availing these services through the existing channels of delivery can act as strong drivers for MFS adoption among the rural under-banked. On the other hand, factors like lack of trust on technology and lack of technology readiness were found to act as barriers to the adoption of MFS.

Keywords*:* Mobile banking, mobile payments, mobile financial services (MFS), TAM.

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1. Introduction

Banking and financial industry during the last few decades have shown tremendous growth in volume and complexity (Leeladhar, 2006). However, the outreach of the banking sector has been found to vary across countries (Beck, Demirguc-Kunt, & Peria, 2007). The Financial Access Initiative (FAI), a research consortium based at New York University, has identified that 2.5 billion adults worldwide do not have a savings or credit account with either a traditional (regulated bank) or alternative financial institution (such as a microfinance institution) ("Half of the world is "unbanked" - new global estimate reveals 2.5 billion adults worldwide lack savings or credit account," 2009). This scenario had also developed because of the high cost of maintaining bank branches and low volume of transactions in the rural areas making branch based banking in such areas unviable. On the other hand, penetration of mobile technology had been substantial in the past few years and is expected to increase in the future. Financial institutions, which have had difficulty providing profitable services through traditional channels to poor clients, see mobile financial services (MFS) as a form of 'branchless banking' (Ivatury & Mas, 2008), which lowers the costs of serving low-income customers. The technological development has provided opportunities for service providers to develop their services and offer customers more flexibility. As a consequence, banks have launched multiple service access methods via new delivery channels like ATM, internet and mobile phone(Laukkanen & Pasanen, 2007). Low-cost banking can bring into its fold a considerable group of consumers who formerly could be served only at too high a cost (Datta, Pasa, & Schnitker, 2001). However, studies have shown that there had been bottlenecks in the rate of adoption in MFS in various parts of the world.

This paper demonstrates the preliminary findings of an ongoing research undertaken for determining the dimensions affecting the adoption of MFS and estimate the demand of such services. The study is aimed to help all different player of the MFS ecosystem (including financial institutions, mobile operators, merchants, regulators and others) as well as different organizations in proper planning of MFS initiatives and ensuring optimal benefits out of these initiatives. Though there exist a series of study towards determining the factors affecting the adoption of MFS, majority of these studies testified the views of the population having adequate access to various existing channels of banking and financial services. However, the perspective of the under-banked[1] and unbanked[2] population had been overlooked in majority of the existing studies. During this study the dimensions emerging out of the existing literature was first listed. This was followed by an exploratory qualitative research on rural under-banked population of two states (viz. Jharkhand and Rajasthan) in India. The dimensions identified from the

[1] Under-banked people would have at least one bank account with very less transaction both in terms of volume and value which may be either due to lack of accessibility to banking and financial services and/or lack of demand of such services.
[2] Un-banked population are those who do not avail any banking or financial service.

exploratory study were further compared with those found from the existing literature. The findings of the study indicate that the demand for the core service (banking and financial service in this case) and the amount of hardships faced in availing these services through the existing channels of delivery had a strong impact on the demand for MFS among the rural under-banked. On the other hand, factors like lack of trust on technology and technology readiness were found to act as barriers to the adoption of MFS. However, issues related to security and privacy of data was not found to be relevant for this section of the population.

2. Methodology

Given the fact that more than forty four countries across the world have already implemented or initiated implementation of MFS either in the form of mobile banking and/or mobile payments, and a substantial amount of study has been conducted in order to understand the characteristics of such initiatives, a review of secondary literature was undertaken during this study for understanding the factors affecting the adoption of MFS. In all, twenty nine published articles were found that were related to studies that were conducted to determine factors for adoption of MFS among the consumers. Through secondary literature review, thirty four factors were found that were studied for their effect on the adoption of MFS. During the analysis of the existing literature, it was quite evident that the existing studies were conducted either on people who have already used some form of MFS and/or having adequate access of various other channels of banking and financial services. Considering the fact that in many countries especially the developing economies including India where a very large section of the population is deprived of adequate access to banking and financial services and implementation of MFS is at a very nebulous state, it becomes very interesting to understand the validity of the factors that have already been studied and also to identify any additional factor(s) that would be critical for adoption MFS. In order to achieve this objective, an exploratory qualitative research was undertaken through in-depth interviews and focused group discussions among the rural under-banked population in three different states in India. The findings of the exploratory study was then compared with that of the existing literature to propose a model that would be more suitable for understanding adoption of MFS among the rural under-banked population.

In-depth interview, focused group discussion and observation techniques were adopted while interacting with a set of rural population including banking agents, people having bank accounts as well as people not having a bank account in three different states (viz. Gujarat, Jharkhand and Rajasthan)[3] in India. These states were selected considering the fact that one state (Gujarat) is one of the most economically progressive states, while Jharkhand is one of the most economically backward states in Indian and

[3] http://www.un.org/apps/news/story.asp?NewsID=35323&Cr=undp&Cr1= [Accessed on August 9, 2010]

Rajasthan falls somewhere in between the two in terms of economic growth. Two villages from each of these states were chosen for data collection. All the villages were well connected through roads and were very near to the national highway. Each of these villages had one bank branch in the vicinity which was again shared among around ten villages and the nearest ATM from each of these villages was at a distance of ten to fifteen kilometers. All the individuals in the sample, except two used mobile phones. During the interactions, the participants were first asked about their awareness and usage of banking services. They were further probed about their acceptance of mobile technology and ATM. Given the fact that none of the participants were aware about MFS, they were first briefed about the features of MFS and then they were asked about the perceived drivers and inhibitors in availing such services.

3. Mobile Financial Services (MFS)

The term "mobile financial services" (MFS) encompasses a broad range of financial activities that consumers engage in or access using their mobile phones. MFS can be divided into two distinct categories: mobile banking (m-banking) and mobile payments (m-payments) (Boyd & Jacob, 2007). Mobile banking is defined as "a channel whereby the customer interacts with a bank via a mobile device, such as a mobile phone or personal digital assistant (PDA)" (Barnes & Corbitt, 2003). Mobile payments on the other hand are defined as the use of a mobile device to conduct a payment transaction in which money or funds are transferred from a payer to a receiver via an intermediary, or directly without an intermediary (Niina Mallat, 2006). The terms "mobile banking" and "mobile payments" describe distinct but in some cases overlapping sets of products. Some m-banking platforms provide services, such as money transfers, that are considered forms of mobile payment, while some m-payments products are so closely linked to bank accounts as the source of funds that they assume m-banking functions (Boyd & Jacob, 2007). MFS refer collectively to a set of applications that enable people to use their mobile telephones to manipulate their bank account, store value in an account linked to their handsets, transfer funds, or even access credit or insurance products (Donner & Tellez, 2008).

3.1 MFS Adoption

During the past decade, a considerable amount of research on mobile financial services has emerged. Majority of these studies have applied research models and frameworks traditionally used within the IS literature. A substantial amount of academic research is focused on examining the determinants of

computer technology acceptance and its utilization. Among the different models that have been proposed, TAM (F. D. Davis, 1989; L. D. Davis, Bagozzi, & Warshaw, 1989), appears to be the most widely accepted among information systems researchers. According to TAM, a user's adoption of a new technology is determined by that user's intention to use the system, which in turn is determined by the user's beliefs about the system. TAM further suggests that two beliefs – perceived usefulness and perceived ease of use – are instrumental in explaining the variance in users' intentions. Many authors used the TAM and various extended versions of TAM to research consumer acceptance of mobile banking applications (Chung & Kwon, 2009; Gu, Lee, & Suh, 2009; Kleijnen, Wetzels, & Ruyter, 2004; Luarn & Lin, 2005; Yu & Fang, 2009). Diffusion of innovation theory (Rogers, 1995) was used by some researchers (Brown, Cajee, Davies, & Stroebel, 2003; Luarn & Lin, 2005; Niina Mallat, 2006; Niina Mallat, Rossi, & Tuunainen, 2008) for determining the characteristics for adoption of MFS.

Various studies have been conducted to extend the base TAM as well as other extended models of TAM by testing the significance of different constructs and antecedents. For example, perceived financial cost, system quality and social influence had been added to the original TAM constructs and were found to be positively associated with consumer intentions to use mobile banking services (Kleijnen, et al., 2004). Other studies repeatedly listed mobile device attributes like tiny displays, slow data connection, weak usability, and associated cost as inhibitors of mobile banking services (Laukkanen & Pasanen, 2007; N. Mallat, Rossi, & Tuunainen, 2004). The effect of trust has also been identified along with other dimensions on the adoption of MFS (Gu, et al., 2009; Luarn & Lin, 2005). The dimensions and their corresponding definition that were found to emerge out of the existing literature are given in table 1. A concept matrix showing the frequency of various factors appearing in various research articles is presented in table 2 and the reference of each study along with the region of study has been provided in table 3. The linkages among factors that were tested and found significant in existing studies are shown in figure 1. The values (a, b) mentioned in on the linkages within the figure 1, where the value for 'a' denotes the number of articles in which the link was found significant and value for 'b' suggests the insignificant occurrences within the existing literature. The linkages that were found significant in multiple studies are represented through darker lines compared to the ones that were found significant only in a single study.

In addition to these factors, various consumer demographic factors were also found to have its effect on adoption of MFS. In one study, age and education was found to have a major influence on the use of the mobile phone in banking services(Suoranta, 2003). While, gender and age were found to be the main differentiators in another study (Laukkanen & Pasanen, 2007).

Dimension	Definition
Accessibility	Easy to reach, approach or obtain (http://dictionary.reference.com/browse/Accessibility)
Attitude towards MFS	The degree to which using a technology is positively or negatively valued by an individual (F. D. Davis, 1989; L. D. Davis, et al., 1989).
Banking needs	The variety of banking products and services required by an individual (Tan & Teo, 2000).
Behavioral Intention	A cognitive plan to perform a behavior or action, created through a choice/decision process that focuses on beliefs about the consequences of the action. (http://www.marketingpower.com/_layouts/dictionary.aspx)
Compatibility	The degree to which an innovation is viewed as being consistent with the existing values of users (Agrawal & Prasad, 1997).
Convenience	The extent to which the prospective user perceives that mPayment increases convenience in the payment process (L. D. Chen, 2006)
Expressiveness	Expressiveness defined as the degree to which a user perceives a mobile service as suitable for expressing his or her emotions and social or personal identity (Goeke & Pousttchi, 2010)
Facilitating conditions	The extent of technology and other external support (e.g. government support) in the environment (Tan & Teo, 2000).
Firm reputation / Familiarity with the bank	A firm's reputation reflects its reliability in business engagements. It increases customers' recognition, plays a role in forming their initial confidence and helps to maintain their confidence in future transactions (K. Kim & Prabhakar, 2004).
Initial trust	People's initial trust reflects their willingness to take risks in order to fulfill their needs (K. Kim & Prabhakar, 2004).
Innovativeness	Inclination of an individual to try out any new information systems (C. Kim, Mirusmonov, & Lee, 2010).
Interpersonal relationship	Interpersonal relationship refers to the strength of personal bonds that develop between customers and their service provider (Cheong, Park, & Hwang, 2004).
Mobile experience	Prior experience of using a similar class or type of technology (Tan & Teo, 2000).
Mobility	Mobility refers to the system being available anytime, anywhere (Agnieszka Zmijewska, 2005).
Network externalities	Payment systems exhibit network externalities as the value of a payment system to a single user increases when more users begin to use it (Niina Mallat, 2006)
Perceived credibility	Perceived credibility is defined as the extent to which a person believes that the use of mobile banking will have no security or privacy threats. (Luarn & Lin, 2005; Wang, Wang, Lin, & Tang, 2003)
Perceived ease of use / Complexity	Perceived ease of use refers to the degree to which a person believes that using a particularly stem would be free of effort (F. D. Davis, 1989). Complexity refers to the degree to which an innovation is considered relatively difficult to understand and use (Taylor & Todd, 1995).
Perceived financial cost	Perceived financial cost is defined as the extent to which a person believes that using mobile banking will cost money (Luarn & Lin, 2005).
Perceived risk	The perceived sense of risk concerning disclosure of personal and financial information (Tan & Teo, 2000).

Perceived self-efficacy	An individual's self-confidence in his or her ability to perform a behavior (Taylor & Todd, 1995).
Perceived usefulness	Perceived usefulness is defined here as the degree to which a person believes that using a particular system would enhance his or her job performance (F. D. Davis, 1989).
Privacy	The extent to which the prospective user is concerned about the following privacy aspects relevant to m-payment (L. D. Chen, 2006).
Relative benefits/advantage	Relative benefits are realized when a new service offers greater value to customers than existing ones in such ways as improvements in economic benefits, personal image, convenience and satisfaction (Rogers, 1995; Taylor & Todd, 1995).
Security	The extent to which the prospective user is concerned about the authentication, confidentiality, Non-Repudiation and data integrity relevant to m-payment (L. D. Chen, 2006).
Situational normality	Situational normality is referred to ''how normal or customary the situation appears to be" (Baier, 1986; Gefen et al., 2003a; Lewis & Weigert, 1985).
Speed of transaction	The extent to which the prospective user perceives that m-payment improves the speed of transaction (L. D. Chen, 2006).
Structural assurance	Structural assurances refer to ''safety nets such as legal resource, guarantees, and regulations existed in a specific context" (Gefen et al., 2003a; McKnight et al., 1998; Shapiro, 1987).
Subjective norm / Social influence	Social influence is defined as ''a person's perception that most people who are import to him think he should or should not perform the behavior in question" (Fishbein & Ajzen, 1975).
System quality	System quality is defined as the degree to which individuals perceive that the system is satisfying, in terms of transfer speed and reliability (Kleijnen, et al., 2004)
Technology anxiety	An individual's tendency to be uneasy, apprehensive, or fearful about the current or future use of a technology (C.-P. Lee, Warkentin, & Choi, 2004)
Trialability	The extent to which users would like an opportunity to experiment with the innovation prior to committing to its usage (Agarwal & Prasad, 1997).
Trust	Trust is a psychological expectation that a trusted party will not behave opportunistically (Bunduchi, 2005; Rousseau, Sitkin, Burt, & Camerer, 1998).

Table 1: Definition of Dimensions

Paper[4]	Perceived ease of use / Complexity	Perceived usefulness	Perceived financial cost	Relative benefits/advantage	Security	Compatibility	Perceived risk	Convenience	Trust	Subjective norm / Social influence	Perceived self-efficacy	Facilitating conditions	Privacy	Mobility	Speed of transaction	Attitude towards MFS	System quality	Technology anxiety	Familiarity with bank	Mobile experience	Initial trust	Structural assurance	Network externalities	Innovativeness	Perceived credibility	Trialability	Banking needs	Situational normality	Expressiveness	Mobile Payment Knowledge	Accessibility	Need interaction	Interpersonal relationship	Awareness
P1	1	1										1								1														
P2	1	1	1								1														1									
P3	1	1							1	1	1	1					1		1			1					1							
P4	1	1	1							1							1																	
P5	1	1	1		1				1																									
P6	1	1	1						1					1															1					
P7	1	1			1	1	1	1					1		1																			
P8	1	1			1			1					1		1																			
P9	1			1	1																													
P10	1		1	1		1	1		1														1											
P11	1		1				1																1											
P12	1	1				1		1	1	1																								
P13	1			1		1	1				1	1								1						1	1							
P14			1		1			1																										
P15				1															1		1													
P16				1																														
P17				1																														
P18				1																														
P19																																		1
P20						1											1	1																
P21	1	1	1	1	1			1																										
P22	1	1				1		1						1										1						1	1			
P23	1	1	1	1								1				1																	1	
P24	1	1			1	1	1	1					1		1																			
P25	1	1			1	1				1				1		1																		
P26	1	1					1				1					1		1														1		
P27					1								1																					
P28	1	1								1														1										
P29		1					1		1		1										1	1												
	20	17	9	9	9	8	7	7	6	5	5	4	4	3	3	3	3	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1

Table 2 Concept Matrix

[4] Reference to the papers is provided in Table 3

Paper	Reference	Country of Study
P1	(Chung & Kwon, 2009)	Korea
P2	(Luarn & Lin, 2005)	Taiwan
P3	(Gu, et al., 2009)	Korea
P4	(Kleijnen, et al., 2004)	USA
P5	(A. Zmijewska, Lawrence, & Steele, 2004a)	Japan
P6	(A. Zmijewska, Lawrence, & Steele, 2004b)	Japan
P7	(L. D. Chen, 2006)	USA
P8	(Dewan & Chen, 2005)	USA
P9	(Yu & Fang, 2009)	Taiwan
P10	(Niina Mallat, 2006)	Finland
P11	(Heijden, 2002)	Sweden and Netherlands
P12	(Dahlberg & Oorni, 2006)	Finland
P13	(Brown, et al., 2003)	South Africa
P14	(Pousttchi, 2003)	Germany
P15	(G. Kim, Shin, & Lee, 2009)	Korea
P16	(Anckar & D'lncau, 2002)	Finland
P17	(Y. Lee & Benbasat, 2003)	---
P18	(Looney, Jessup, & Valacich, 2004)	---
P19	(Laforet & Li, 2005)	China
P20	(C.-P. Lee, et al., 2004)	South Korea and USA
P21	(Viehland & Leong, 2007)	Newzeland and USA
P22	(C. Kim, et al., 2010)	Korea
P23	(Cheong, et al., 2004)	Korea
P24	(L.-d. Chen, 2008)	USA
P25	(Schierz, Schilke, & Wirtz, 2010)	Germany
P26	(Rose & Fogarty, 2006)	Australia
P27	(Linck, Pousttchi, & Wiedemann, 2006)	---
P28	(Barati & Mohammadi, 2009)	---
P29	(Luo, Li, Zhang, & Shim, 2010)	USA

Table 3: Reference to Papers in Concept Matrix

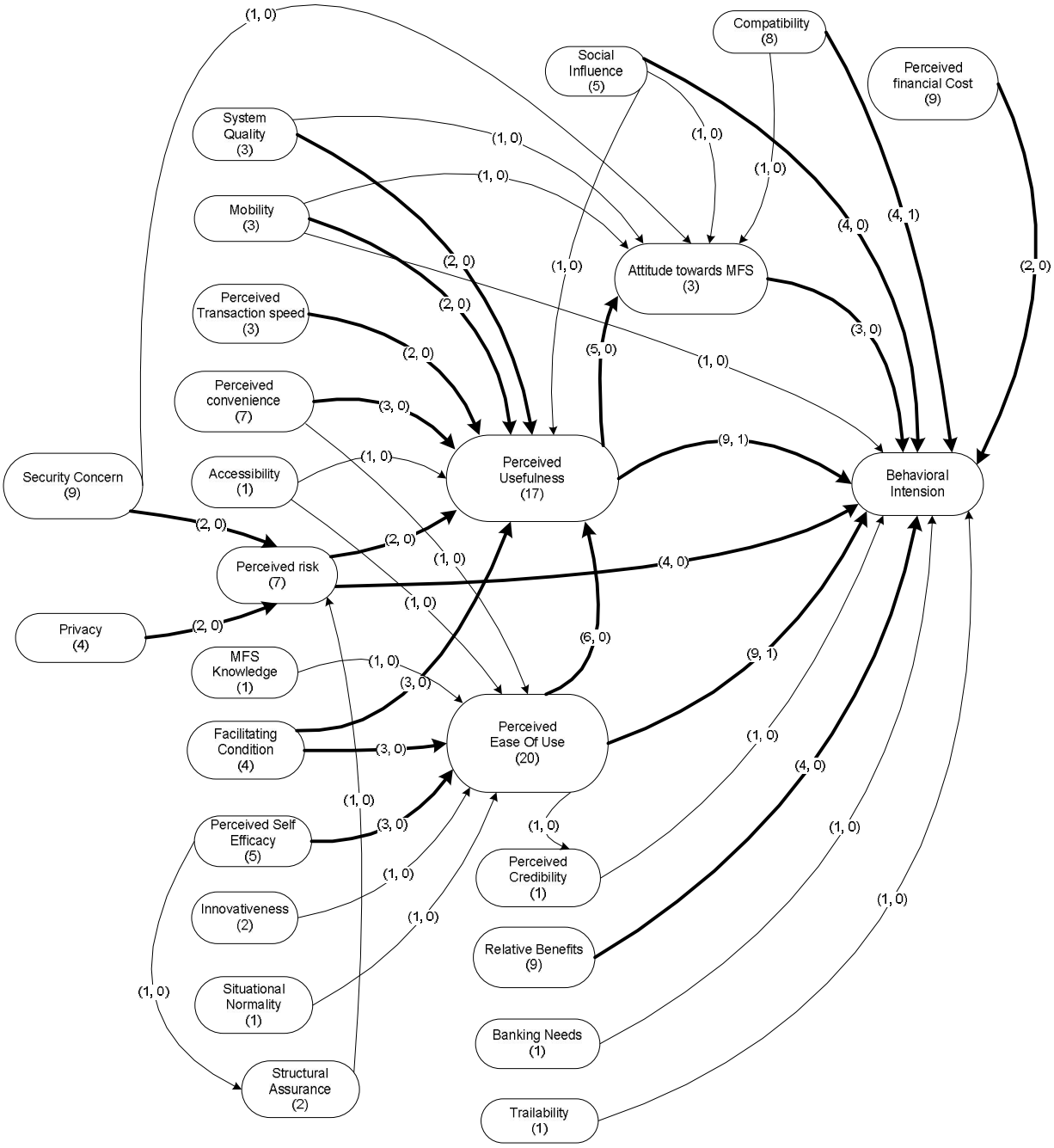

Figure 1: Cumulative Model Derived from Existing Literature Showing Linkages between Factors

4. Findings from the Exploratory Field Study

The exploratory field study among the rural under-banked population revealed some very important drivers and inhibitors for adoption of MFS among this section of the population. The drivers and inhibitors along with their antecedents are summarized in table 4.

Factors	Antecedents
Demand for banking and financial services	Awareness
	Realized Need
	Affordability
Hardships faced in existing channels of banking	Accessibility
	Corruption
	Quality of Service
Perceived usefulness of MFS	Safety and security
	Convenience
	Reduced cost
Trust	Training
	Agent / merchant network
	Peer feedback / Social influence
Technology readiness	Awareness and adoption of ATM
	Awareness and adoption of mobile phones
	Demographics
Ease of Use	Perceived self efficacy
	Local language
Perceived Financial Cost	Cost of handset
	Transaction charges

Table 4: Factors Affecting Adoption of MFS among Rural Under-banked

4.1 Demand for banking and financial services

Demand for the core service (i.e. the banking and financial services) seems to have a direct impact on the demand for MFS. Given the fact that unless and until there is enough demand from banking and financial services, people would not opt for MFS no matter how convenient and accessible the services are. This was evident from the interaction with the poor farmers who were interviewed. It came out very prominently from the discussion that given the financial hardships faced by this section of population, they don't even realize any need for availing any kind of banking services. However, they were found to borrow money from the money lenders and other service providers for their daily needs who charge them with a much higher rate of interest leading these poor people to get caught in the vicious cycle of poverty.

These facts explicitly show a dependency of demand for banking and financial services with that of awareness, realized need and affordability of the people in availing these services. However, the definition of banking needs in this case is somewhat different from that of the earlier studies. While banking needs was considered as the variety of banking products and services required by an individual in

previous studies, it is more about awareness and affordability of the basic products and services in the context of the rural under-banked population. The findings of the study shows that the demand for m-banking service can be increased by increasing the demand for banking and financial services through increased awareness about various available products, converting the unrealized need of the population into realized need for banking and providing affordable services for various segment of the population. Moreover, the products and services offered by the financial organizations also need to be customized according to the need of this segment of the consumer in order to ensure higher adoption of MFS.

4.2 Hardships faced in existing channels of banking

Lots of challenges were found associated with the availability of banking and financial services delivered through the existing channels. Lack of accessibility, poor quality of service and corruption within the bank officials and agent network was found to be the major contribution to the hardship of the population in accessing banking and financial services through the existing channels like branch banking and ATMs. The hardships faced by people in accessing banking and financial services through existing channels were found to increase their willingness for using MFS.

The factor of hardship was also found to increase the perceived usefulness of MFS. This factor can be considered as a close resemblance of the dimensions "relative benefits" or "relative advantage" of m-banking (Yu & Fang, 2009), however, the impact of this factor on the demand or adoption of MFS would be much larger as in the former cases, the user had a choice between various easily accessible channels of banking and looked into MFS as one more channels for accessing the banking and financial services. While in case of the rural under-banked population, there is no way out for them from the existing hardships in accessing banking services. Hence, the effect of this dimension is expected to be more intense on the demand for m-banking compared to that of relative advantage as discussed in earlier studies.

4.3 Perceived usefulness

Perceived usefulness of MFS was found to have a positive effect on the demand and adoption of MFS which supports the findings of many earlier studies. As mentioned earlier, the existing hardships among the population in accessing the banking and financial services was found to be a reason for high perceived benefits for MFS. Though the participants in the study did not have any hands-on experience of using MFS, need for more convenient banking and financial services was found to contribute towards high perceived benefits of MFS as expressed by the participants based on the concept of MFS explained to

them. Many villagers who lived far away from their village for earning a living had to send money to their family members. Such people found MFS to be convenient as well as safe and secure as the villagers perceived that there would be no risk of the money being stolen if it is transferred through a mobile device. Convenience and mobility was the main benefits that were perceived by the villagers.

Moreover, at places where people would need travel around fifteen to twenty kilometers by spending around fifty rupees to reach the nearest bank branch or ATM and then stand in long queues in order to deposit or withdraw money from their account, MFS was considered useful in saving both time and cost. People also felt that MFS would be beneficial for fetching money during the odd hours of the day in case of any emergency. All these aspects lead to convenience in terms of time, effort and money which ultimately enhances perceived usefulness of MFS among the villagers.

4.4 Trust

During the study, it was found that when it comes to monetary transaction for the villagers, they would prefer channels that they trust upon. Existing studies (Donner & Tellez, 2008; Gu, et al., 2009; Luarn & Lin, 2005) on the effect of trust on adoption of MFS had been primarily focused on people's trust on the technology being offered. In case of the rural under-banked population, the complexity of trust was found to be of two folds: first the trust of people on technology and second, the trust on the financial service that is being offered. Thus, generating trust on MFS remains one of the major challenges for ensuring adoption of offered services among the rural under-banked.

The villagers mentioned that, people should be made more aware about MFS and its usage through group meetings and training sessions in order to generate trust among them about MFS. Effectiveness of the agent/merchant network in making people realize the usefulness of MFS by creating a trustworthy ground level infrastructure for MFS would contribute towards generating trust among the people. The villagers also mentioned that, once people around them whom they know would start using MFS, they would gain more trust on the service and would like to use the same. Thus, peer feedback/social influence was found to have a positive impact on the trust of the people on MFS. Both these antecedents can be related with subjective norm/social influence as discussed in earlier studies (Gu, et al., 2009; Kleijnen, et al., 2004).

4.5 Technology readiness

During the interview, it was found that people who have adopted technology enable services like mobile phones and ATMs are more open and eager to adopt MFS. On the contrary, the villagers who have never used an ATM or a mobile phone were found to be reluctant towards the idea of making financial

transaction through mobile phones. This clearly showed that lack of technology readiness among the rural population would another barrier towards ensuring adoption of MFS.

User demographics like education, and age was also found to have impact on the amount of technology readiness of the population. Technology readiness was seen to be higher among the educated people and lower among the higher age groups (greater than 50 years). Thus, technology readiness among the set of population can be determined based on the awareness and adoption of available technologies and a combination of demographics like education and age.

4.6 Ease-of-use

Ease-of-use being one of the core constructs of TAM (F. D. Davis, 1989) have been thoroughly used and tested in various extended models of TAM as well as in models that were based on TAM to understand the adoption of m-banking and m-payments. Our current study also found ease-of-use of MFS to be a very critical factor affecting its adoption among the rural population. Given the fact that, the level of education is not very high among the rural population and they are much more comfortable with their local language, it becomes very important to design a service that is easy to use as well as in the language that the people are comfortable with. Villagers, who had used ATM, stated that initially, they had thought operation of ATM would be difficult, but once they were shown how to use the same, they found it to be easy. People felt the same about the usage of MFS. They stated that once they are demonstrated about the use of the services, they would be able to learn the same quite easily. On the other hand, certain section of people felt usage of technology like mobile and ATM to be complicated and did not have any interest in trying them out. This clearly showed that perceived self efficacy among the people played a very critical role in setting perception about ease of use of the technology and service that is being offered. Hence, ensuring ease of use of the offered service both in terms of technology as well as the financial products being offered would be a very important factor of the adoption of MFS. Moreover, the language of communication needs to be the local language of the region for enhancing ease-of-use.

4.7 Perceived financial cost

The cost of availing the mobile financial services was also a common matter of concern among the villagers who were interviewed. People wanted to know whether they would need to purchase a new handset for using MFS and were also eager to know the cost of transaction for availing this service. People were ready to pay a small amount (in the range of one rupee to two rupees) per transaction for using MFS. People were however very much aware and appreciated the fact that using MFS would save

them a lot of time, effort and money that they current spend for accessing banking and financial services through existing channels of delivery. Cost of the MFS hence is also an important factor that would determine the adoption of the services among the rural population. Given the fact that majority of the rural population falls within the lower income group, the total cost of availing the services need to be minimized for ensuring faster adoption.

5. Mapping the findings with the dimensions of the secondary literature

When the findings of the exploratory study was mapped back with that of the secondary research findings, it was found that the presence of the bank agents and training provided to the end-users would be imbibing trust among the population on MFS. Presence of the bank agents and availability of training can be mapped to structural assurance provided for adoption and usage of MFS, and hence structural assurance was found to influence trust. Peer feedback/word of mouth was found to influence trust on MFS. Peer feedback can be resembled with the dimension social influence that can be found from the secondary literature. However, in existing studies, social influence had been found to have effect on perceived usefulness, and none of the studies had tried to trace its influence on trust. Figure 2 shows the model that is derived by mapping the findings of the exploratory study with the findings of the secondary literature review. The shaded dimensions in the figure represent factors that were either absent in the existing literature or were found to be very less significant. For example, technology readiness and hardships in existing channels of banking were not present in the existing literature, while trust was found to be a strong determinant in the existing studies. On the other hand, the dimension of banking need has been modified to need for banking and financial services by including other financial services like insurance, remittance, etc.

Technology readiness of the respondents was found to affect perceived ease of use. Though technology readiness was not found to be a construct in the existing studies, there had been a couple of instances where mobile experience (or technology experience) was studied for its influence on perceived ease of use and perceived usefulness. However, in both the instances, mobile experience was found to be insignificant in determining its impact on either of the dimensions. On the contrary, our findings suggest that technology experience which in the context of MFS can be measured by the extent of awareness and adoption of mobile phones and ATMs play a vital role in determining the technology readiness among the population and would have a substantial influence on perceived ease of use. Additionally, the demographic factors like age, education and income would also affect technology readiness. In addition to technology readiness, self efficacy was also found to influence perceived ease of use. Technology readiness of the individuals was also found to influence trust as people with higher technology readiness

were found to have more trust on MFS. The findings of the study also indicated that, use of local language had an effect on perceived ease of use rather than on trust as was found from the existing literature.

Perceived financial cost was found to affect behavioral intention towards adoption of MFS which was in accordance with the findings from the secondary literature. On one hand, perceived financial cost for accessing the service acts as barrier towards adoption of MFS, while on the other hand our findings shows that the net reduction of cost as compared to existing channels of banking and financial services would be considered as perceived usefulness of MFS. Perceived convenience in accordance with the findings of the secondary literature was found to influence perceived usefulness. In addition to convenience and reduced cost, the ease of remittance and perceived safety and security of MFS over handling of cash was found to positively contribute towards perceived usefulness of MFS. The ease of remittance in this case can be linked to mobility as mentioned in the existing literature. However, the factors mentioning reduced cost and remittance can actually be merged into convenience as they can be considered as convenience of cost and convenience of time and mobility respectively.

Hardships faced in the existing channels of banking by the rural population was found to be very critical factor affecting perceived usefulness and in turn having positive impact on the behavioral intention towards MFS. Lack of accessibility, low quality of available service and corruption at various levels of the system was found to be the main contributors towards hardship in existing channels of banking. Though hardship within the existing channels was not found as a construct in the existing literature, relative benefits/advantages can be considered among the closest resemblance. Need for banking and financial service was also found to have a strong positive influence on perceived usefulness. However, banking needs as a dimension affecting perceived usefulness had been found only in single study. Awareness, realized needs and affordability of such services were found to contribute towards determining the need for banking and financial services. In accordance with the findings of the secondary literature, perceived risk was found to negatively influence perceived usefulness. Security concern and technology anxiety were the two antecedents that were found to contribute towards perceived risk which also matched with the findings from the existing studies. However, impact of privacy concern that was prominent within the existing literature was found missing among the concerns of the rural population during our study.

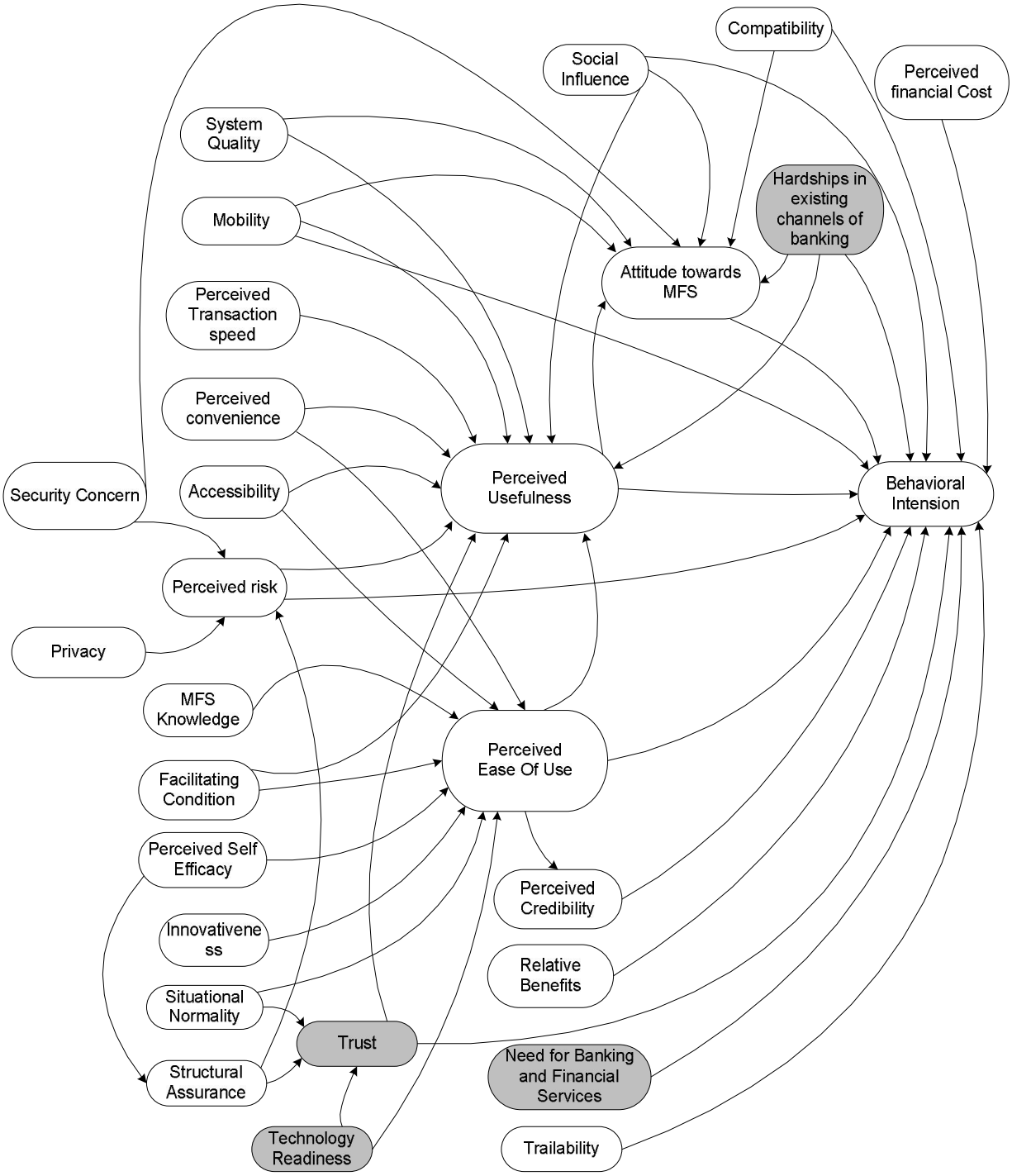

Figure 2: Proposed Model for MFS Adoption among Rural Under-banked

6. Conclusion and Further Research

The study revealed that the demand of the core service (i.e. banking and financial services) along with the hardships faced by the population in availing such services through existing channels of delivery as prime drivers for adoption of mobile enabled financial services among the rural under-banked. On the other hand, lack of trust and low technology readiness was found to be the prime bottlenecks in adoption of such services. In addition, perceived financial cost is also a matter of concern among the rural people. Such bottlenecks could be removed / reduced through increased awareness and usage among the peers. Further, the financial services offered through MFS should also be in accordance with the needs of the target population in order to ensure higher rate of adoption among this segment of the population. Considering the fact that the study was focused on determining the factors affecting the demand for MFS among the rural under-banked population, which meant a substantial amount of technology as well as service accessibility leapfrogging from lack of adequate banking services to mobile based banking services, of the factors like "demand for banking and financial services" and "hardships faced in existing channels of banking" was found to be the major determinants for estimating the demand of MFS. Moreover, factors like trust and technology readiness were found to have substantial impact on the adoption of MFS among the target population which was further influenced by awareness, social influence and technology experience.

Additionally, two other aspects were found through this study. Firstly, the factor trust was not found to be very significant factor in the existing literature related to adoption of MFS adoption. However, trust was found to be a very important factor for ensuring adoption of MFS among the rural population. Secondly, factors like perceived risk and concerns about privacy and security of the MFS that were found to be pronounced in the existing studies (as shown in figure 1) that were conducted on population having adequate accessibility to various alternative channels of financial services, was not observed in the case of the rural under-banked population. The reasons for such a difference could be the lack of awareness about the probable risk of technology and non availability or limited availability of affordable and quality financial services. This can also be related to lesser resistance among the rural under-banked in switching from the existing channels of financial service delivery to MFS as compared to the population that is comfortable with the accessibility and quality of the banking and financial services available to them through the existing channels.

Further research can be conducted by adding the constructs of trust, hardship faced in existing channels of banking, technology readiness and demand for banking and financial services within the model in figure1in order to test and determine the degree of impact that these factors on the overall demand of

MFS. Further research can also be conducted for determining the impact of each of these factors on demand of MFS among the population where accessibility to banking and financial services is absent or negligible.

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