

**INVESTIGATING A FRAMEWORK FOR PROVIDING MOBILE
BANKING OPPORTUNITIES TO RURAL SMES IN
BANGLADESH**

A Dissertation Presented

by

Md Taimur Ahad

Supervisors

Dr Laurel Evelyn Dyson

Dr Valerie Gay

Submitted to
Faculty of Engineering and Information Technology (FEIT)
Of the
University of Technology Sydney (UTS)
of the requirements for the degree of

Master of Science in Computing Sciences (Research)

August, 2014

Table of Contents

Table of Contents	iii
Table of Figures.....	x
Table of Tables	xi
Certificate of Original Authorship	xii
Acknowledgements	xiii
Abstract	xv
Publication for this research.....	xvii
Chapter 1	1
Introduction to the research.....	1
1.1 Background of the study	1
1.2 M-banking studies on SMEs.....	3
1.3 M-banking studies in Bangladesh.....	5
1.4 Current research gap in m-banking.....	5
1.5 Aims of this research	7
1.6 Research questions.....	8
1.7 Significance of the research	8
1.7.1 Theoretical significances	9
1.7.2 National level significances	9
1.7.3 Organizational level significances	10
1.7.4 Individual level significances	10
1.8 Contributions	11
1.9 Methodology.....	11
1.10 Brief summary of the findings	12
1.11 Outline of the thesis	13
Chapter 2	15
The research context: Bangladesh.....	15
2.1 Introduction.....	15
2.2 Bangladesh: demographic information	16
2.2.1 Language	17
2.2.2 Literacy Rate.....	18
2.2.3 Bangladesh Economy.....	18
2.3 SMEs in Bangladesh.....	19
2.3.1 What are SMEs?	19

2.3.2	<i>Definitions of SMEs in Bangladesh</i>	19
2.3.3	<i>Characteristics of SMEs</i>	20
2.3.4	<i>SMEs' contributions to the Bangladeshi economy</i>	21
2.3.5	<i>Factors affecting the growth of SMEs in Bangladesh</i>	22
2.4	Bangladesh banking sector	23
2.4.1	<i>Banking arrangements and finance of the SMEs in Bangladesh</i> ...	24
2.5	ICT ecology in Bangladesh	24
2.5.1	<i>Landline telephone subscribers in Bangladesh</i>	25
2.5.2	<i>Internet subscribers in Bangladesh</i>	26
2.6	Mobile phone industry in Bangladesh	26
2.6.1	<i>Mobile phone industry regulators in Bangladesh</i>	27
2.6.2	<i>Mobile phone subscribers in Bangladesh</i>	29
2.7	IT adoption and usage in Bangladeshi banks	29
2.7.1	<i>IT adoption phases in Bangladeshi banks</i>	29
2.7.2	<i>The Central Bank's activities and initiatives</i>	31
2.8	E-banking in Bangladesh	31
2.8.1	<i>E-banking adoption challenges in Bangladesh</i>	32
2.8.2	<i>Recommendations to overcome e-banking challenges in Bangladesh</i>	32
2.9	Conclusion	32
Chapter 3		33
M-banking: An opportunity for SMEs		33
3.1	Introduction.....	33
3.2	Defining M-banking	34
3.2.1	<i>Models of m-banking</i>	35
3.2.2	<i>Technology in m-banking</i>	35
3.3	M-banking in Bangladesh.....	35
3.4	Past, present and future: Research on m-banking.....	36
3.5	M-banking advantages	38
3.5.1	<i>M-banking usage and advantages for the SME</i>	40
3.6	Micro and Macro factors in m-banking	41
3.6.1	<i>Micro-level factors</i>	42
3.6.2	<i>Hypothesis development</i>	47
3.7	Macro-level m-banking success factors.....	51
3.7.1	<i>Ready mobile phone infrastructure</i>	51
3.7.2	<i>Supportive organisational culture to promote m-banking</i>	51

3.7.3	<i>Partnership and communication among stakeholders</i>	52
3.7.4	<i>Government's support of m-banking</i>	52
3.7.5	<i>Supportive national culture to promote m-banking</i>	52
3.7.6	<i>M-banking: Legal and regulatory implications</i>	53
3.7.6.1	Customer perspective regulations	53
3.7.6.2	Providers' perspective regulations	53
3.7.6.3	National level policy and regulations	54
3.8	Barriers to m-banking adoption	56
3.9	Knowledge sharing and recommendations of the stakeholders	58
Chapter 4	59
Research design and research methodology	59
4.1	Introduction.....	59
4.2	Restatement of the research questions	59
4.3	Research design	60
4.4	The Philosophical idea of the research	61
4.5	Research Methodology	62
4.5.1	<i>Mixed method research</i>	64
4.5.2	<i>Strategies of inquiry</i>	66
4.5.3	<i>Survey procedures</i>	66
4.5.3.1	Selection of villages and survey participants.....	66
4.5.3.2	The population, sample and participants	67
4.5.3.3	Justification of quantitative research and participant number ..	68
4.5.3.4	Developing and Pre-testing the questionnaire	68
4.5.3.5	The pilot study	70
4.5.3.6	Survey instrument.....	71
4.5.3.7	Items and variables	71
4.5.3.8	Measurement.....	73
4.5.3.9	The survey process	73
4.6	Qualitative Research	73
4.6.1	<i>Interview</i>	74
4.6.1.1	Selecting banks, telcos and expert representatives	75
4.6.1.2	Gaining access to the organizations.....	77
4.6.1.3	Interview instrument.....	78
4.6.1.4	Interview process	79
4.6.2	<i>Focus group</i>	80

4.6.2.1	Selecting the bank and gaining access to the bank	80
4.6.2.2	Selecting the members of the focus group.....	80
4.6.2.3	Focus group discussion instrument and pre-test of questions...	81
4.6.2.4	Focus group discussion process.....	82
4.7	Ethical considerations	83
4.8	Data interpretation and analysis.....	85
Chapter 5	86
Data analysis and results	86
5.1	Introduction.....	86
5.2	Quantitative data (Survey of SME owners/managers) analysis and results	86
5.2.1	<i>Demographic Data</i>	86
5.2.2	<i>Participants' banking and current problems in banking</i>	89
5.2.2.1	Banking status.....	90
5.2.2.2	Banking frequency.....	90
5.2.2.3	Satisfaction with current banking system	91
5.2.2.4	Support provided to the start-up of SMEs by Banks	92
5.2.2.5	Banking services used by the SMEs.....	93
5.2.2.6	Alternative ways of banking.....	93
5.2.3	<i>Participants' mobile phone adoption and usages of mobile phones</i>	94
5.2.3.1	Mobile phone ownership	94
5.2.3.2	Mobile phone usage.....	95
5.2.3.3	Knowledge on the mobile phones among the survey participants	96
5.2.4	<i>Participants' knowledge, opinions and intention to use m-banking service</i>	96
5.2.4.1	SME owners/managers' previous knowledge on m-banking ...	96
5.2.4.2	Benefits of using m-banking for SMEs	97
5.2.4.3	Concern and barriers in using m-banking to the rural SMEs....	97
5.2.4.4	Intention to use m-banking service.....	98
5.2.5	<i>Hypothesis testing</i>	98
5.2.6	<i>Evaluation of the model</i>	101
5.2.6.1	Overall model evaluation:.....	101
5.2.6.2	Goodness of Fit.....	101
5.3	Focus group (m-banking provider) data analysis and results	102
5.3.1	<i>Advantages of using m-banking by the rural SMEs</i>	102

5.3.1.1	Improved banking system for rural SMEs	102
5.3.1.2	The opportunity to offer private bank's service to rural SMEs.....	103
5.3.1.3	The opportunity to create employment by the bank	103
5.3.1.4	Improved rural-urban SME business	104
5.3.1.5	Better control of finance of SME.....	104
5.3.2	<i>Macro and organisational favourable factors</i>	104
5.3.2.1	Ready mobile telecommunication infrastructure	105
5.3.2.2	The central bank's initiatives	105
5.3.2.3	Creating focus on m-banking.....	105
5.3.2.4	Engagement with the SMEs.....	106
5.3.2.5	IT competency of the bank	106
5.3.2.6	SMEs competency	106
5.3.3	<i>Obstacles in m-banking implementation</i>	107
5.3.3.1	MTOs reluctance to make partnership with small banks.....	107
5.3.3.2	Operational obstacle	107
5.3.3.3	M-banking agent management.....	108
5.3.3.4	SME's limited knowledge of technology	108
5.3.3.5	SMEs' shared phone usage	108
5.3.3.6	Conceptual understanding of banking using a mobile phone	108
5.3.3.7	Competition with illegal money transfer	109
5.3.4	<i>Recommendations</i>	109
5.4	Interviews (Bankers, MTO officers and expert representatives) results	110
5.4.1	<i>Rural SME in Bangladesh</i>	110
5.4.1.1	Rural SME banking	111
5.4.1.2	Rural SME's mobile phone adoption.....	113
5.4.2	<i>M-banking advantages</i>	114
5.4.2.1	M-Banking advantages for the rural SMEs	114
5.4.2.2	M-banking advantages for the banks	115
5.4.2.3	M-banking advantages for mobile telecommunication operators (MTOs)	118
5.4.3	<i>Macro-level m-banking factors for rural SMEs in Bangladesh</i> ..	118
5.4.3.1	Country-level factors	118
5.4.3.2	Organizational critical success factors.....	120
5.4.4	<i>Barriers in m-banking adoption</i>	122
5.4.4.1	Rural SMEs' lack of banking awareness of banking benefits	122

5.4.4.2	Lack of banks' and MTOs' effective leadership and limited vision on m-banking	122
5.4.4.3	M-banking providers' competencies	123
5.4.4.4	Problems managing m-banking stakeholders	123
5.4.4.5	Psychological barrier	123
5.4.4.6	Security	124
5.4.5	<i>Recommendations</i>	124
5.4.5.1	Government's intervention.....	124
5.4.5.2	Awareness development among SMEs.....	125
5.4.5.3	Banks and MTOs capabilities checking.....	125
5.4.5.4	Improve legislation to protect customers.....	125
5.4.5.5	Real time inter-bank transaction.....	126
5.4.5.6	Research and knowledge sharing.....	126
5.4.5.7	System quality	126
5.4.5.8	Security	127
5.5	Conclusion:	127

Chapter 6 129

Discussions 129

6.1	Introduction.....	129
6.2	Discussions on rural SMEs in Bangladesh	129
6.2.1	<i>Findings: Rural SME business characteristics.....</i>	<i>129</i>
6.2.2	<i>Demographic profile of rural SME owners/managers</i>	<i>130</i>
6.2.3	<i>Findings: Rural SMEs banking</i>	<i>132</i>
6.2.4	<i>Findings: rural SMEs owners'/ manager' mobile phone usage..</i>	<i>133</i>
6.2.5	<i>Findings: SME owners'/managers' previous knowledge on m-banking and intention to use the service.....</i>	<i>134</i>
6.2.6	<i>Conclusion</i>	<i>135</i>
6.3	Discussions on R.Q 1: Benefits of m-banking.....	136
6.3.1	<i>M-banking benefits for rural SMEs</i>	<i>136</i>
6.3.2	<i>M-banking benefits for banks, MTO and country.....</i>	<i>138</i>
6.4	Discussions on R.Q 2: Customer perspective factors in m-banking adoption by rural SMEs.....	140
6.5	Discussions on R. Q 3: Organisational and country-level factors in m-banking adoption	141
6.5.1	<i>Organisational factors.....</i>	<i>142</i>
6.5.2	<i>Country level factors in m-banking adoption</i>	<i>143</i>

6.6	Discussions on R.Q 4: Barriers to implementing m-banking for the rural SMEs in Bangladesh.....	146
6.7	Discussions on R. Q 5: Recommendations in m-banking adoption by rural SMEs	149
Chapter 7		153
Conclusion and future research direction		153
7.1	Introduction.....	153
7.2	Answers to the Research Questions.....	153
7.2.1	<i>R. Q. 1: What benefits can be achieved for the rural SMEs, banks, telecommunication organisations and the government by offering m-banking to the rural SMEs in Bangladesh?.....</i>	<i>153</i>
7.2.2	<i>Answer to R. Q 2: What are the customer perspective factors which influence the intention of rural SMEs to adopt m-banking in Bangladesh?</i>	<i>155</i>
7.2.3	<i>Answer to R. Q. 3: What are the country-level and organisational factors that impact on implementing m-banking for rural SMEs in Bangladesh?</i>	<i>155</i>
7.2.4	<i>Answer to R. Q 4: What are the barriers in implementing m-banking for the rural SMEs in Bangladesh?.....</i>	<i>156</i>
7.2.5	<i>Answer to R. Q 5: What are the stakeholders' recommendations in m-banking adoption for rural SMEs in Bangladesh?.....</i>	<i>157</i>
7.3	The m-banking framework	157
7.4	Practical and theoretical values.....	160
7.5	Limitations of this research	161
7.6	Future Research Directions.....	162
7.7	Conclusion	162
References		164
Appendix A: Bangladesh at a glance		180
Appendix B: M-banking Literature Gap		181
Appendix C: M-banking Drivers and Factors		182
Appendix D: Databases used for M-banking Literature Review		184
Appendix E: Extract from survey questionnaire		185
Appendix F: Interview instruments (Bank officers)		187
Appendix G: Interview instruments (MTO officers)		192
Appendix H: Interview instruments (Expert representatives)		197

Table of Figures

Figure 2.1: Map of Bangladesh	17
Figure 2.2: Total Telephone, Fixed line and Mobile	27
Figure 2.3: Mobile Industry analysis in Bangladesh	28
Figure 2.4: Technology Diffusion in Bangladesh.....	30
Figure 3.1: M-banking research direction	37
Figure 3.2: M-banking framework based on hypotheses.	48
Figure 3.3: M-banking barriers and concerns.....	57
Figure 4.1: Research Design Framework (Creswell 2003)	61
Figure 4.2: Research Methodology.....	65
Figure 4.3: Data Collection Strategies.....	69
Figure 5.1: Banking frequencies.....	91
Figure 5.2: Participants' intention to adopt m-banking.....	98
Figure 6.1: Micro-level customer factors based on the survey.....	141
Figure 7.1: A framework for providing m-banking to rural SMEs in Bangladesh	157

Table of Tables

Table 2.1: GDP Composition by sections.....	18
Table 2.2: SME definition by Bangladesh Banks (2011).....	20
Table 2.3: Structure of banking industry in Bangladesh	23
Table 2.4: Landline phone subscribers	25
Table 2.5: Internet, and broadband users and subscribers	26
Table 2.6: Mobile phone subscribers in Bangladesh	29
Table 2.7: E-banking facilities in Bangladesh	31
Table 3.1: Definitions of m-banking	34
Table 3.2: Drivers in m-banking research	43
Table 4.1: Variables and items Included in the survey.....	72
Table 4.2: Details of interviewees	76
Table 4.3: Focus group participants' expertise.....	81
Table 5.1: Demographic data.....	86
Table 5.2: Banking status of the SMEs	90
Table 5.3: Reasons for SMEs not having a bank account	90
Table 5.4: Comments on banking satisfaction.....	91
Table 5.5: Reasons for being dissatisfied	92
Table 5.6: rural SME finance statistics.....	92
Table 5.7: Banking service used by SMEs	93
Table 5.8: Alternative way of banking	94
Table 5.9: Mobile phone ownership	94
Table 5.10: Use of mobile phone among SMEs	95
Table 5.11: Knowledge on a mobile phone among rural SMEs.....	96
Table 5.12: Previous knowledge on m-banking	96
Table 5.13: M-banking benefits and advantages for SMEs.....	97
Table 5.14: Barriers in m-banking adoption.....	98
Table 5.15: M-banking variables testing using MLR	99
Table 5.16: Hypothesis testing by comparison using MLR	100
Table 5.17: Goodness of fit and Pseudo R-Square	101
Table 6.1: M-banking advantages for rural SMEs.....	137
Table 6.2: M-banking advantages for banks, MTOs and country	139
Table 6.3: Organisational factors in m-banking adoption	142
Table 6.4: Country-level factors in m-banking adoption	144
Table 6.5: Concerns and barriers in m-banking adoption	147
Table 6.6: Stakeholders' recommendations in m-banking adoption	150

Certificate of Original Authorship

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

Production Note:
Signature removed prior to publication.

Signature of Student:

Date: 8/7/2014

Acknowledgements

This thesis would not have been accomplished without the marvellous help, I received from my supervisors, the participants in this research, the University of Technology Sydney (UTS) research support team and my family. I take the opportunity to thank those people who contributed to this research and to whom I am greatly indebted.

First of all, I had the great fortune to study under the supervision of Dr Laurel Dyson and Associate Professor Valerie Gay. I am very grateful for their supervision and guidance. Their sage advice, insightful criticisms and patient encouragement aided the writing of this thesis in innumerable ways. I am especially grateful to my principal supervisor Dr Laurel Dyson, a great person and a scholar in mobile technology, for the skilful ways in which she lovingly challenged and supported me throughout the whole of this thesis—knowing when to push and when to let up. I would also like to thank my alternative supervisor, Valerie Gay, a great scholar in mobile technology, for her support and contributions in this research.

The completion of the thesis would have been a myth if not for Bee Bee Chua, who actually encouraged me to do this research and directed me to the right path. Thank you Bee Bee for trusting me on my abilities. I would also like to extend my heartfelt gratitude to Dr Terry D. Royce, Senior Lecturer & Research Coordinator, who spent a lot of time to help improve my writing and English.

I would also like to acknowledge and thank all the research participants and particularly the Small and Medium Enterprise (SME) owners and managers, who gave their time to the survey and shared their views despite of their shortage of time. The focus group and interview participants from the banks and mobile operators who participated actively in the research also deserve more than a simple ‘thank you’ and I hope the findings from this research will be a useful reference to them and their companies.

Without the financial support from UTS, this research could not have become reality. I therefore thank UTS and a range of people from Faculty of Engineering and IT and the

Research Administration. Especially, I would like to thank Craig Shuard, the **Research Administration Officer**, who was there always with extended support regarding any administrative needs.

Last but definitely not least, I would like to thank my wife Saiky, my son Ayat, my parents, and my brother Vaia for their emotional support and encouragement during this research. Thanks for their endless love and support throughout my life.

Abstract

The purpose of this thesis is to develop an m-banking (mobile banking) framework for rural SMEs (small and medium enterprises) in Bangladesh. This research is significant as there is relatively little known about the use of m-banking by SMEs in Bangladesh, despite their importance as the second largest source of income in the country. The research, as well as adopting a business focus rather than a consumer focus, as most studies to date have done, also pinpoints several factors that have been largely overlooked in the literature. In seeking to identify a comprehensive range of both micro- and macro-level determinants of m-banking, the resulting framework includes customer perspectives, organisational perspectives and country-level factors that impact on the adoption of m-banking by rural SMEs. In developing the framework, the research employed a mixed methods approach, consisting of a survey of SME owners and managers, followed by interviews and a focus group study with banks and MTOs (Mobile telecommunication organisations).

The research found that poor banking facility, cost, credibility, gender, education and SME business type are the main customer perspective factors that significantly influence the intention of SME owners and managers to adopt m-banking. The findings suggest that the most important advantages of m-banking for rural SMEs comprise improved banking facility, easy settlement of trade, and an improved SME business environment due to faster transactions and better cash management. On the other hand, for banks and MTOs, m-banking can generate profits, improve customer service and management, decrease operating costs, increase brand image and create employment in rural areas. The findings with respect to organizational factors suggest that having an m-banking project within the bank's/MTO's objectives, their level of engagement with SMEs, the technology and human resource capabilities of the banks, the development of mobile infrastructure, and top-level management's support are important in m-banking development. However, barriers to providing m-banking to the rural SMEs include lack of banks' effective leadership, limited vision regarding m-banking by the stakeholders, MTOs' reluctance to make partnerships with new banks, and m-banking providers' competencies and security. Country-wide factors identified included concern over lack of proper policy and regulation in Bangladesh.

The framework will be of value to the government, banks and MTOs in accelerating the development of m-banking in Bangladesh. The research recommends that, in order to support rural SMEs, government intervention in m-banking projects and policy and regulations development is needed. This research is expected to support national policies, such as the Millennium Development Goal 2015 and the National IT Policy of Bangladesh. Furthermore, it has implications for other developing countries in improving their banking provision to SMEs and realizing their own development goals through mobile technologies.

Publication for this research

Ahad, M. T., Dyson, L. E & Gay, V. (2013). Investigating macro-level M-Banking For Rural SMEs From The Bank Perspective, Proceedings of The First AIS-Journals Joint Author Workshop in PACIS, Jeju Island, Korea, June 18, 2013. .

Link: <http://www.cob.calpoly.edu/~eli/AIS-JJAW-PACIS2013/1-1.pdf>

Ahad, M. T., Dyson, L. E & Gay, V. (2013). Exploring M-Banking For Rural SMEs From The Bank Perspective, Pacific Asia Conference on Information Systems (PACIS).

Link: <http://aisel.aisnet.org/pacis2013/216/>

Ahad, M. T., Dyson, L. E & Gay, V. (2012). Towards an M-Banking Framework for Rural SMEs in Bangladesh, IBIMA 2013, Spain.

Link: <http://www.ibima.org/spain2012/papers/mdta.html>

Ahad, M. T., Dyson, L. E & Gay, V. (2012). An Empirical Study of Factors Influencing the SME's Intention to Adopt m-Banking in Rural Bangladesh, Journal of Mobile Technologies, Knowledge & Society, vol. 2012.

Link: <http://www.ibimapublishing.com/journals/JMTKS/2012/508433/508433.pdf>

Chapter 1

Introduction to the research

1.1 Background of the study

Small and Medium Enterprises (SMEs) are very important in the Bangladeshi economy as SMEs contribute to a significant proportion of economic development in the country. SMEs provide the second source of livelihood in Bangladesh, after farming (Davis et al. 2010). SMEs have been playing a pivotal role in fostering economic growth, sustaining global economic recovery, reducing poverty, and industrializing since the independence of Bangladesh in 1976 (Ahmed & Chowdhury 2009, Alam & Ullah 2006, Khan et al. 2012, Siddiquee, Islam & Rahman 2006). The recent GDP growth rate in Bangladesh from a mere 3.7% in the 1980s to more than 6% in 2012 is also a resultant effect of SMEs improvement (Moazzem 2008). To achieve the committed Millennium Development Goals (MDG) of 2015, the development process of Bangladesh must strive towards the improvement of SMEs, especially the rural SMEs (Mahmuda, Baskaran & Pancholi 2010).

Though the significance of the SMEs in the Bangladeshi economy has been recognized in all the five-year development plans, the sector received very little banking support from the traditional bricks-and-mortar banks (Ardic, Mylenko & Saltane 2012, Chowdhury 2007, Khan et al. 2012). SME banking is provided by the government banks, private banks and micro-financers in Bangladesh. The traditional banks require the client to provide identification and business documents to open an account. But the informal nature of SME business and sometimes the inability to supply business documents put SMEs at a disadvantage in the formal banking system (Khan et al. 2012). Moreover, SMEs are not attractive clientele to the traditional banks because of their low capitalization, insufficient assets and their inability to comply with collateral requirements. The rural SME banking situation is even more severe. Rural SMEs can only bank with the government banks, but government banks are less SME focused. Thus, like many developing countries, Bangladeshi SMEs are unbanked, or deprived of sophisticated banking facilities (Nichter & Goldmark 2009).

However, some research studies have suggested that SMEs banking constraints in the developing countries can be improved using mobile banking (m-banking) (Bångens & Söderberg 2011, Higgins, Kendall & Lyon 2012, Kumar, Martin & O'Neill 2011). M-banking is defined as performing balance checks, account transactions and payments, transfers using a mobile phone. SMEs in Uganda (Ndiwalana, Morawczynski & Popov 2010), Tanzania (Bångens & Söderberg 2011) and Kenya (Mas & N'gweno 2012) have benefitted substantially from using m-banking. M-banking in these countries is used in SMEs to pay suppliers, receive customer deposit and to settle trades with wholesalers (Ndiwalana, Morawczynski & Popov 2010). These studies suggest that the banks can target SME owners as a user group since the number of SMEs retail payments is surprisingly high. Moreover, these SMEs use of m-banking is more than the national average of personal use (Higgins, Kendall & Lyon 2012) and more than large enterprise use (Ndiwalana, Morawczynski & Popov 2010). M-banking, therefore, is now at the centre of intense national interest for SMEs banking in countries like South Africa, Kenya, Philippines, India and more recently, in Bangladesh.

Recently, there has been a growing impetus in Bangladesh towards the adoption of m-banking. Furthermore, the latest initiative of the Central Bank to offer banking service to the unbanked population has also sparked an impetus towards m-banking adoption. Private banks such as Trust bank, Dutch Bangla Bank, and BRAC bank have come forward in the implementation of m-banking. In fact, with 75 million mobile phone users, 99% of the population living within the mobile network and 45% unbanked population (BRTC 2013, CIA 2013), Bangladesh is an attractive place for m-banking. M-banking was first introduced as the Short Message Service (SMS) banking by the private banks in Bangladesh. The early m-banking service had very limited functionality, such as viewing one's own account details, balance and mini statement. However, with the deregulation of policy on 29th November 2009, current m-banking services in Bangladesh offer cash-in, cash-out, fund transfer for merchant payment, salary disbursement and utility payments (Rahman 2012).

1.2 M-banking studies on SMEs

Recently SMEs use of m-banking has been the subject of numerous studies in developing countries (Bångens & Söderberg 2011, Higgins, Kendall & Lyon 2012, Kirui, Okello & Nyikal 2010, Kirui, Okello & Nyikal 2012, Kumar, Martin & O'Neill 2011). Primarily, SMEs in India, Uganda, Kenya and Tanzania have received most of the attention by the m-banking researchers. These studies meticulously analyze various payment systems between SMEs to SMEs, SMEs to customers and customers to SMEs in developing countries and answers, how the business version of m-banking can be developed? Furthermore, analyzing m-banking advantages for SMEs, providing adoption theories and identifying limitations in m-banking for business use are also some contemporary phenomenon in m-banking research studies.

A most popular topic in m-banking research is from the micro-level customer perspective (Amin 2011, Bankole & Cloete 2011, Daud et al. 2011, Donner 2008, Kadušić, Bojović & Žgalj 2011, Jia-bao 2011, Luarn & Lin 2005, Ratten 2011, Shen et al. 2010, Tobbin 2009, Wei 2011, Peevers 2011). The micro-level customer perspective studies mainly concentrate on the behavioural issues, such as consumer behaviour, the acceptance of m-banking and the adoption of m-banking. These studies explain behavioural beliefs about the likely evaluation of the service, normative beliefs and normative expectations of the service, control beliefs about the presence of factors that may facilitate or impede the performance of behaviour and the perceived power of these factors. The factors are from consumer, social, and security perspectives. The more favourable the customer's attitude and subjective norm, and the greater the customer's perceived control, the stronger should be the customer's intention to use m-banking. However, most of the customer perspective adoption studies use Information System (IS) theories as IS theories have a relation to the individual's preference and reaction (Goodhue & Thompson 1995).

Following this research from customer perspective, Bångens and Söderberg (2011), Higgins, Kendall and Lyon (2012) and Kumar, Martin and O'Neill (2011) have provided insights into the adoption and acceptance of m-banking by small business

owners. The SME perspective m-banking adoption studies are engaged to identify business perspective factors in m-banking adoption. Combining entrepreneurship factors with the customer perspective factors such as advantage, usefulness, ease-of-use, trust, risk and usability, these studies attempt to determine a businessman's intention to adopt m-banking. The studies suggest that a businessman has a different perspective than a non-businessman in adopting m-banking. This is because, SMEs owners require sending or receiving money more frequently than an individual for settlement of business transactions, for salaries to employee payment, or for family support and for suppliers payment. Therefore, these studies argue that there is a role of entrepreneurship in m-banking adoption by the SMEs owners (Ratten 2012).

Apart from customer perspective factors, macro-level factors also impact positively or negatively on the implementation of m-banking (Duncombe & Boateng 2009, Weber & Darbellay 2010). The macro-level factors are from the organizational perspective and from the country level perspective. Researchers suggest the organisation structure, the firm's culture, management style and brand image can promote m-banking development (Duncombe & Boateng 2009, Saleem & Rashid 2011, Weber & Darbellay 2010). Country level factors are banking policy, IT regulations, national level policies such as new account opening procedures, the national payment system, m-banking transaction policy, e-signature policy and e-commerce policies (Ivatury & Mas 2008, Weber & Darbellay 2010). However, it remains to be investigated, how macro-level factors impact on m-banking adoption for SMEs in Bangladesh.

Preliminary investigation suggests that there are a myriad of interesting properties associated with m-banking adoption. It is important to have a deeper understanding on these properties from customer, organisation and country viewpoints. However, previous studies on m-banking have addressed the topics separately. Moreover, only a relative handful of studies have specially examined all possible micro-level and macro-level m-banking determinants. Therefore, a complete and comprehensive knowledge on the service is still required, especially in Bangladesh.

1.3 M-banking studies in Bangladesh

Like many other underdeveloped countries, Bangladesh has also become an attractive place for m-banking research. The similar trend in m-banking research worldwide is also reflected by existing m-banking research efforts in Bangladesh. The Bangladeshi m-banking research studies are dominated by the customer perspective adoption studies and technology perspective studies (Ahmed, Rayhan & Islam 2011, Alam et al. 2010, Deb, Harun & Bhuiyan 2011, Dewan & Dewan 2009, Mousumi & Jamil 2010). The customer perspective studies are mainly conducted in big cities and conducted from person-to-person usage. Most of the customer perspective research studies report that consumers are favourable to m-banking in Bangladesh (Ahmed, Rayhan & Islam 2011, Dewan & Dewan 2009). Some studies have included m-banking within other forms of electronic banking and attempted to identify the determinants (Baten & Kamil 2010, Hasan et al. 2010, Nupur 2010). However, m-banking is a separate entity and it has different dimensions than internet banking, ATM and online banking. This is because some of the m-banking customers in Bangladesh, particularly in rural areas, are new to banking, and the design limitations and different functionality and communication modes of mobile phones mean that m-banking needs to be considered separately. On another dimension, the macro-level m-banking research studies in Bangladesh mainly examine the national payment system, the m-banking regulation and m-banking transaction policy in the country (Rahman 2009, Sultana 2009). The studies report that the Central Bank and the government are supporting m-banking implementation by introducing new regulations related to m-banking that can support and grow m-banking.

1.4 Current research gap in m-banking

Despite the huge potential of m-banking for SMEs in developing countries, most of the studies are conducted from the person-to-person usage perspective. Business usage of m-banking such as paying the suppliers or receiving payments from customers has been completely ignored. Worldwide, the lack of m-banking research in the SME sector is one of the significant gaps in m-banking research. No research has attempted to provide

an m-banking framework for the SME (Bångens & Söderberg 2011, Chavan et al. 2009, Higgins, Kendall & Lyon 2012, Kumar, Martin & O'Neill 2011). The availability of m-banking alone does not ensure that SMEs will adopt the service. Predicting SMEs' intention to adopt m-banking is important because SMEs are the second most important source of income in developing countries, particularly for the rural SMEs, there are few banking alternatives. There is a need, therefore, to understand their acceptance of m-banking and to identify the drivers, inhibitors, risks and satisfaction factors. Research should investigate banking practices of SMEs and find how m-banking would fit with SMEs' payment systems. This is because social practice and contextual norms greatly influence the money management and financial activities (Medhi, Ratan & Toyama 2009).

M-banking service is new in Bangladesh and still in its infancy. Thus m-banking research in Bangladesh has several limitations, leaving a great deal of room for development. These are as below:

Firstly, despite the fact m-banking has great potential to offer banking services to the SMEs, particularly rural SMEs, and the area has received inadequate attention by m-banking researchers. Thus, lack of comprehensive m-banking research on SMEs is one of the main gaps in Bangladeshi m-banking research.

Secondly, to date, there is no research that attempts to provide a comprehensive m-banking framework that includes all possible customer human, social, and business perspective factors. This is important as m-banking adoption greatly depends on the technological, contextual and social perspectives (Bankole 2011, Daud et al. 2011, Kadušić, Bojović & Žgalj 2011, Min, Lu & Yinjun 2011, Yang 2011).

Thirdly, the customer perspective research studies are city based, rural settings where 65% people live are completely ignored (Ahmed, Rayhan & Islam 2011, Dewan & Dewan 2009).

Fourthly, it is surprising that a large number of the m-banking literature is conceptual and lacks support from primary data (Dewan & Dewan 2010). Moreover, instead of using strong empirical evidence, the customer perspective research studies are founded on a small number of participants (Duncombe & Boateng 2009)

Fifthly, current m-banking research in Bangladesh tends to under-estimate the true extent of complex factors, by providing only survey based customer perspective research (Ahmed, Rayhan & Islam 2011, Dewan & Dewan 2009, Rahman 2012). The most dominant data collection strategy is using a prepared questionnaire. The questionnaire includes popular adoption factors derived from current m-banking literature. The method is quite valid. However, it is a conservative approach, as it limits the range of adoption factors and cannot reveal the whole story (Bångens & Söderberg 2011, Chavan et al. 2009, Higgins, Kendall & Lyon 2012, Kumar, Martin & O'Neill 2011). M-banking research into a new market can generate new knowledge of complex factors. Research should be more exploratory by nature to uncover the latent factors in the new markets, such as Bangladesh.

Lastly, currently there is no research from the bank's perspectives that discuss macro-level factors such as organizational critical factors, country-level factors and obstacles in m-banking implementation. It is therefore difficult to gain any relevant insights into the internal process that how banks undergo to implement m-banking.

1.5 Aims of this research

Inspired by the lack of m-banking research for rural SMEs, this study seeks to investigate an m-banking framework for the rural SMEs in Bangladesh. The framework aims to assist Bangladeshi banks in implementing m-banking for the rural SMEs. The aims of this study are (1) to provide insights into the factors that influence the intention of rural SMEs to adopt an m-banking (2) to explore the organizational and country level factors that impact m-banking implementation for rural SMEs and (3) to identify the advantages of m-banking for rural SMEs. The aims are realized through a survey with 500 SME owners/managers in 4 villages, interviews with 25 IT and bank officials and a

focus group study with an m-banking provider. There is a growing concern that m-banking research should be founded on empirical studies and that data should be collected from larger numbers of participants than has occurred to date (Duncombe & Boateng 2009). The numbers of participants used in this research compare very favourably with existing studies, most of which are based on limited numbers. Furthermore, this research is one of the earliest attempts to examine m-banking in a rural Bangladesh setting.

1.6 Research questions

Since the research has the intention to develop an m-banking framework for the rural SMEs in Bangladesh, the study wishes to come up with answers to the following questions:

1. What benefits can be achieved for the rural SMEs, banks, telecommunication organisations and the government by offering m-banking to the rural SMEs in Bangladesh?
2. What are the customer perspective factors which influence the intention of rural SMEs to adopt m-banking in Bangladesh?
3. What are the country-level and organizational factors that impact on implementing m-banking for rural SMEs in Bangladesh?
4. What are the barriers in implementing m-banking for the rural SMEs in Bangladesh?
5. What are the stakeholders' recommendations in m-banking adoption for rural SMEs in Bangladesh?

1.7 Significance of the research

This research offers various significant values to the rural SMEs, banks, MTOs (Mobile telecommunication organisations) and government in developing countries in general, and particularly in Bangladesh. Therefore, the practical and theoretical significances of the research are categorized as below:

1.7.1 Theoretical significances

This study contributes significantly to the theoretical understanding of m-banking through a development of an m-banking framework for rural SMEs in Bangladesh. A major contribution of this research is to the existing knowledge and literature in m-banking by providing both micro and macro-level adoption factors as well as inhibitors in general and in particular in Bangladesh (Bångens & Söderberg 2008, Porteous 2006, Duncombe & Boateng 2009, Weber & Darbellay 2010). The research is one of the few works that collected data from banks, MTOs and m-banking experts' to explore organizational and country level factors that impact m-banking adoption in Bangladesh. Lastly, this paper identifies some new factors, both from the customer perspective and from the macro-level perspectives, which have been rarely identified in prior IS (Information systems) literature.

1.7.2 National level significances

This research contributes greatly to the national concern in Bangladesh of how to make full use m-banking for the unbanked individuals and SMEs? Therefore, the research is being undertaken at the right time as m-banking has been a national interest in Bangladesh. Furthermore, Bangladesh has exciting and motivating plans and goals; such as Millennium development goals 2015 and the National IT Policy 2009. The research is expected to support the national policies undertaken in Bangladesh, especially the Central Bank's plan of using m-banking in facilitating banking advancements for the rural development. Lastly, the outcomes of this research can significantly help Bangladeshi government and NGOs in formulating better policies for banking development. Following the outcomes of this research, developing countries which have similar socioeconomic conditions may also receive useful knowledge from this study when developing m-banking for the rural unbanked population.

1.7.3 Organizational level significances

This research is significant to the SMEs, banks, MTOs and Bangladeshi government as these organizations are the primary beneficiaries of the research. The significances are outlined as below:

- Since banking is one of the main obstacles of SMEs in developing countries, specifically in Bangladesh, this research provides a solution to the banking problems of SMEs, particularly rural SMEs.
- This research answers how a bank can implement m-banking to provide better banking facilities to the unbanked. Furthermore, the framework, investigated in this research can assist banks to redefine their banking business model regarding the remote customers. The findings from this research should help the banks to plan their strategies in reaching remote customers and in accelerating m-banking development.
- M-banking is a new topic in Bangladesh. The practical value of this research is that, the research can assist m-banking policy makers such as the government and the Central bank in introducing and formulating better m-banking policy. Moreover, the results of the research could be used in encouraging banks that do not have m-banking, to implement m-banking, in improving m-banking of the banks and in enhancing the quality of the service.

1.7.4 Individual level significances

The outcomes of this research will be of potential value in increasing m-banking awareness in Bangladesh, especially among the SME owners and managers. SME owners and managers can get information about m-banking potential for business use. From a practical perspective, the bank management may require information about what factors impact on the consumer decision to adopt m-banking. This research can help the bank managers to identify factors and determinants that influence the adoption of m-banking. The m-banking policy makers and the MTOs management should find valuable information related to m-banking implementations. To other researchers, the study may provide useful insights into human behavioural and motivational factors which affect attitudes towards the adoption and use of m-banking service in developing countries.

1.8 Contributions

This research aims to make contributions to the knowledge as follows:

- The study contributes significantly to the global understanding of m-banking through a development of an m-banking framework for rural SMEs in Bangladesh.
- A major contribution of this research is to the existing knowledge and literature in the m-banking by providing both micro and macro-level adoption factors as well as inhibitors in general and in particular in Bangladesh (Bångens & Söderberg 2008, Porteous 2006, Duncombe & Boateng 2009, Weber & Darbellay 2010).
- The study contributes significantly to the global understanding of m-banking advantages for the rural SMES through a development of an m-banking framework for Bangladesh.
- It provides current research efforts in m-banking as well as the knowledge gap in the m-banking.
- The research is one of the few works that collected data from banks, MTOs and m-banking experts' to explore organizational and country level factors that impact m-banking adoption in Bangladesh.
- Lastly, this paper identifies some new factors, both from the customer perspective and from the macro-level perspectives, which have been rarely identified in prior literature.

1.9 Methodology

Both qualitative and quantitative methods were used in this research. A quantitative approach (survey questionnaires) was used to investigate the factors which impact on the intention of rural SME owners/managers to adopt m-banking in Bangladesh. On the other hand qualitative research (interviews and focus group) was used to discover the macro-level organizational and country level critical success factors of m-banking diffusion in Bangladesh. The followings are various phases of the research.

Phase 1-Literature Review and Planning: The first phase of the research consisted of following activities:

- Study of the m-banking adoption literatures in Bangladesh and in other developing countries. Furthermore, various information system theories were studied to understand micro and macro-level factors in technology diffusion.
- Examine research methods and techniques for data collection.
- Questionnaires and interview instrument preparation.
- An exploratory visit was made to Bangladesh to gain familiarity with the villages and the SMEs that are considered for the survey. Another purpose was to test the questionnaires by a group of IT professionals, bank officers and Telco officials in Bangladesh.

Phase 2-Investigation Phase: In this phase three sets of data will be collected in Bangladesh as below:

- A survey among SMEs was conducted to find out their specific banking needs and factors associated with m-banking adoption.
- Interviews with the bank and MTO officers to find out organizational factors related to m-banking.
- A focus group study with an m-banking provider to reveal the motivating factors of a bank. The survey data were analysed by statistical software SPSS version 17 and the qualitative data were analysed using Nvivo10.

Phase 3-Thesis Developments:

The framework, produced as a result of the literature review and three data collection phases is finalized.

1.10 Brief summary of the findings

This study presents an m-banking framework for the rural SMEs in Bangladesh. The framework investigates customer perspective, organizational perspective and country-level adoption factors. The research presents the poor banking satisfaction, credibility, cost, gender, education and the business type of the SME as significant customer

perspective factors which impact on the intention of rural SME owners and managers to adopt m-banking in Bangladesh. The research yields, m-banking is a suitable banking system for rural SMEs in Bangladesh. This research also presents, currently Bangladesh is positioned perfect for m-banking development because of the central bank's decision to implement m-banking. However, to be successful banks need to create a clear vision of their m-banking initiative at a strategic level. The banks should treat it as a business critical rather than simply a technical or operational issue. Top management support, IT competency, engagement with the target markets are some organizational success factors in m-banking. However, impediments in offering m-banking for rural SMEs are, SMEs' limited knowledge on mobile phone, operational obstacle in m-banking, m-banking agent management and competition from illegal money transfer systems in rural areas of Bangladesh.

1.11 Outline of the thesis

This thesis is organized as follows:

Chapter 2: The research context-Bangladesh

The chapter introduces Bangladesh to the readers and aims to set the scene for this research. The sections of this chapter are, demographic, SMEs and contribution of SMEs, the banking environment and information technology in Bangladeshi banks.

Chapter 3: M-banking- literature review

In chapter 3 the relevant m-banking research studies are reviewed to provide a theoretical foundation for the research. The concepts of m-banking and use of m-banking in SME are described. It identifies the key adoption drivers, obstacles and usability features of m-banking in light of current m-banking research. A section is devoted to m-banking in Bangladesh too. The chapter also addresses the research gap in m-banking worldwide and specifically in Bangladesh.

Chapter 4: Research design and research methodology

The chapter highlights the research design, research methodology and the data collection procedures used in this research. It starts with the discussion of the

underlying epistemology of qualitative and quantitative approach used in this research followed by a justification of using the mixed method research. The processes used in the survey, interview and focus group are also presented. This chapter also describes the testing and administration of the interview and questionnaire as well as the statistical methods used to develop factors and measurement variables and to examine the relationships between constructs. It concludes with a discussion of the response rate and the pre-testing and analysis of research results.

Chapter 5: Data analysis

This chapter presents the data analysis and the results of qualitative and quantitative data. The data analysis includes (1) the customer perspective enabling/ hindering factors in m-banking (2) the organisational and country level success factors (3) the motivation of the banks to implement m-banking (4) the usability suitable for rural SMEs by using descriptive statistics, Cross- Tabulation, T-Test and regression analysis of SPSS version 14.0 and qualitative data coding using Nvivo 10. The coding protocol is described along with the analysis of collected data. The chapter emerges essential as the knowledge of this chapter will be interpreted to develop the m-banking framework.

Chapter 6: Discussion

This chapter presents a discussion in detail of the data analysis of the previous chapter. With the support of a literature review conducted in chapter 3, this chapter justifies how the findings are answering the research questions raised in this thesis. In addition, the implications of the research including theoretical, methodological and practical implications are discussed along with the limitations of the study.

Chapter 7: Conclusion:

The chapter provides a conclusion of the thesis and future research direction in m-banking.

Chapter 2

The research context: Bangladesh

This chapter introduces Bangladesh to the reader and aims to set the scene for the research. The chapter consists of four different sections: demographic information on Bangladesh; SMEs in Bangladesh; banking in Bangladesh; and Information Technology in Bangladesh, particularly within the banking sector. The next chapter presents the m-banking literature review.

2.1 Introduction

Bangladesh, one of the newest nations in the world, received its independence in 1971. Since independence, the country has gained significant success in the empowerment of women, micro-credit utilisation, rural development, SME improvement and recently in mobile phone adoption (Ahsan 2005, Hashemi et al.1996). Research studies suggested privatisation, financial sector liberalisation and policy reformation had a resultant effect on these achievements and made a positive contribution to the economy of Bangladesh (Alam et al. 2007, Chowdhury 2001, Bhattacharya & Chowdhury 2003, Moazzem 2008, Reaz & Arun, 2006).

The country has a mainly agro-based economy and SMEs rank second in the economy (Mintoo, 2006) . Since independence, SMEs in Bangladesh are contributing to the national economy. Bangladesh recognises the SMEs' contributions, but being an underdeveloped country, the resources to support SMEs are always inadequate (Hossain 1998). Access to finance is the most difficult obstacle the SMEs confront (Beck & Kunt, 2006, Beck et al. 2006, Nichter & Goldmark, 2009). More specifically, the rural SMEs are always deprived of various government supports as they are not attractive clientele to the private banks.

In the last two decades, banks have played a vital role in advancing the economic and social condition of Bangladesh. Private banks have proven their excellence over the government banks by introducing innovative banking, and by implementing Information Technology in banking.

Bangladesh is promoting Information and Communication Technology (ICT) as the flagship of positive change in the country. Government is encouraging the use of ICT in every possible sector and has been working relentlessly to step up the peace and the prosperity of the country through proper utilisation of ICT. Nowadays, computers, IT and mobile phones are becoming a part of national culture (Rahman 2005). Bangladesh has been chosen as the location for this research because of its substantial achievement over time in mobile phone penetration, the precondition of mobile banking.

2.2 Bangladesh: demographic information

Bangladesh, officially the People's Republic of Bangladesh, is a low-lying riverine country located in South Asia in the north-eastern portion of the Indian subcontinent (see Figure 2.1). Bangladesh is mainly a flat and plain land, but full of lakes, rivers and surrounded by seas and oceans (Schendel 2009). Bangladesh is the second largest river basin in the world (behind the Amazon). Historically and culturally Bangladesh was a part of Bengal. The country is bordered on the west, north, and east by India; on the southeast by Burma (Myanmar); and on the south by the Bay of Bengal. It is one of the largest deltas in the world with a total area of 147,570 sq km. With a unique communal harmony, Bangladesh has a population of about 140 million, making it one of the most densely populated countries in the world.

Dhaka is the capital and largest city of Bangladesh located in the geographic centre of the country. Today it has become the hub of the nation's industrial, commercial, cultural, educational and political activities.



Figure 2.1: Map of Bangladesh

Source: web site of the Government of Bangladesh

2.2.1 Language

Bangla is the state language of Bangladesh and it is spoken in all spheres in Bangladesh. English received continued support in education, culture and commerce since independence in 1971. English in Bangladesh is mainly functional rather than interpersonal and inter-institutional. English is mainly used in the urban area; among high officials, elite society, military, media and in the legal system. However, there is a growing generation in Bangladesh that prefer and use English more than the older generations (Jinnah 2011). Among villagers, English knowledge starts with the alphabet and ends with grammar or reading a sentence.

2.2.2 Literacy Rate

Bangladesh has made major progress in recent years in primary and secondary education. According to Asian Development Bank (2013), in 2010 the literacy rate was 56.8%. Bangladesh has a strong national commitment to education with the State having ‘a Constitutional obligation of providing basic education to all its citizens by removing illiteracy within a given time frame’ (UNESCO 2013). The definition of a literate person is ‘one who can read, write, calculate and be socially aware.’

2.2.3 Bangladesh Economy

Bangladesh is an agricultural country, with some three-fifths of the population engaged in farming. Jute and tea are principal sources of foreign exchange. Labour-intensive manufacturing is another major pillar of the national economy (see Table 2.1 for more GDP contributors). Garment exports and remittances from Bangladeshi working overseas, mainly in the Middle East and East Asia, fuel economic growth. Over 50% of Bangladesh’s GDP comes from the service sector. Despite this, two-thirds of the country’s population is engaged in agricultural activities, with most of them growing paddy.

Table 2.1: GDP Composition by sections

Sector	Percentage of GDP
Agriculture	21%
Industry	27%
Services	52%

According to the World Bank, Bangladesh has achieved a growth rate of 5.7% in FY2009. The country has registered significant expansion in its middle class. The consumer industry has grown considerably. The increasing foreign direct investment highlights the growth rate of the Bangladesh economy.

2.3 SMEs in Bangladesh

SMEs are important in almost every developing country as SMEs significantly participate in economic development, rural development, poverty reduction and employment. SMEs in developing countries always receive a high esteem for their dynamism, potentiality and effectiveness (Kamsties, Hormann & Schlich 1998). Moreover, SMEs' productivity can easily provide uplift without much national or foreign investment as is required for larger enterprises (Berry, Rodriguez & Sandee 2001). However, research supports that SMEs do not receive specific attention to overcome barriers to their growth and development.

2.3.1 What are SMEs?

SMEs cover a wide range of businesses and activities in Bangladesh. SMEs have active footsteps from production to service, from manufacturing to finance. SMEs include production, manufacturing, wholesale, retail trade and service, and repairs (Mintoo 2006). SMEs cover a wide range of industries and services such as electronics, software, agro-processing and plantation, leather, knitwear, healthcare products, pharmaceuticals and cosmetics (Ahmed & Chowdhury 2009).

2.3.2 Definitions of SMEs in Bangladesh

SMEs in Bangladesh are defined differently by different organisations. Furthermore, the definitions have changed overtime in different industrial policy pronouncements (Alam & Ullah, 2006). The definitional problem has caused the lack of a nationwide framework for SMEs and the non-availability of information about SMEs. Uddin (2006) notes the scarcities of comprehensive knowledge about SMEs have aroused controversies on the SMEs' contribution in Bangladesh. Furthermore, previous definition of SME in 2008 by Bangladesh Bank (the Central Bank) was conflicting with the new Industrial Policy of 2010. However, the latest definition by Bangladesh Bank has redefined small and medium enterprises in line with the Industrial Policy 2010 and brought two new entities micro and cottage industries under its SME credit policy and programmes (see Table 2.2 for more SME definitions).

Table 2.2: SME definition by Bangladesh Banks (2011)

(Source: Bdnews24.com, 2011)

<p>MICRO INDUSTRY/ENTERPRISE</p> <p><i>In manufacturing, micro industry/enterprise would be those with assets worth Tk* 500,000 to 5 million (defined as above) and/or 10 to 24 workers or less.</i></p> <p><i>In service industry and in business, micro enterprises will be those which employ 10 or less people and have assets (defined as above) worth Tk 500,000 or less.</i></p>
<p>SMALL INDUSTRY/ENTERPRISE</p> <p><i>In manufacturing, small industry/enterprise would be those with assets worth Tk 5 to 100 million (defined as above) and/or 25 to 99 workers.</i></p> <p><i>In service industry and in business, small enterprises will be those which employ 10 to 25 and have assets (defined as above) worth Tk 500,000 to 10 million.</i></p>
<p>MEDIUM INDUSTRY/ENTERPRISE</p> <p><i>In manufacturing, medium industry/enterprise would be those with assets worth Tk 100 to 300 million (minus land and factory building, and including replacement value) and/or 100 to 250 workers.</i></p> <p><i>In service industry and in business, medium enterprises will be those which employ 50 to 100 and have assets (defined as above) worth Tk 10 to 150 million.</i></p>

* Tk= Bangladeshi currency

**1Tk = AUD 0.07 (Australian Dollar) at time of writing

As this new definition of SMEs was introduced for the banks and financial institutions, and this research aims to provide m-banking framework for the rural Bangladesh, the definition of micro business was considered for this research. Therefore, this research focused on small and medium enterprises in the rural Bangladesh which employ 10 or less people and have assets (defined as above) worth Tk 500,000 or less.

2.3.3 Characteristics of SMEs

SMEs in Bangladesh are characterised as highly diverse, heterogeneous and deal with traditional to modern products. Chowdhury (2007) highlights that SMEs are characterised by low capitalisation and limited assets, geographical diversity and high mortality in Bangladesh. SMEs in Bangladesh are attributed with high growth rate, high

labour intensity, and dependence on the indigenous skills and technology (Uddin 2006). In Bangladesh, SMEs' dynamism in adverse conditions such as scarcity of capital allocation and lacking technical efficacy is very interesting.

2.3.4 SMEs' contributions to the Bangladeshi economy

Small and Medium Enterprises (SMEs) are very important in Bangladesh as SMEs provide the second source of livelihood in the country after farming (Ardic, Mylenko & Saltane 2012, Davis et al. 2010). In general, SMEs represent 25% of GDP, 25% of employment, 90% of industrial structure in Bangladesh (Alam & Ullah, 2006). SMEs have been playing a pivotal role in fostering economic growth, sustaining global economic recovery, reducing poverty, and industrialising since the independence of Bangladesh (Khan et al. 2012). Moazzem (2008), therefore suggested the recent economic development in Bangladesh is a resultant effect of SMEs' performance.

The main contribution of SMEs to the Bangladeshi economy is the GDP development which aids poverty reduction in Bangladesh (ADB 2013, Ahmed & Chowdhury 2009, Mazumdar 1991). SMEs' GDP development in Bangladesh is always accompanied by an increase of overall GDP in the country. Moreover, SMEs' development in Bangladesh is much higher than the larger enterprises.

SMEs participate greatly in society development by creating new business and generating employment opportunities for the rural and illiterate population. In Bangladesh a significant portion of the population is deprived of education. SMEs are an earning source for the illiterate and semi-literate population, which is unique in society development. The SMEs contribute in two ways: firstly by increasing the skills and capabilities of the SME owners; and secondly by increasing their business skills without the need for further education.

SMEs are also considered as the seedbed for large enterprises and industrialisations. The vertical and horizontal growth of the SMEs over time foster large scale industrialisation in Bangladesh (Moazzem 2008). In the future, to achieve the

committed Millennium Development Goals (MDG) of 2015, the development process of Bangladesh must strive towards the improvement of SMEs, especially the rural SMEs (Mahmuda et al. 2010).

A large section of SMEs in Bangladesh conduct business in rural areas. Interestingly the contribution of these rural SMEs is not measurable due to their informal way of doing business. However, research studies claim rural SMEs reduce unhealthy rural-urban migration by increasing employment in rural areas (Ardic, Mylenko & Saltane 2012, Davis et al. 2010).

2.3.5 Factors affecting the growth of SMEs in Bangladesh

Though the significance of the SMEs in the economy has been recognised in all the five-year development plans in Bangladesh, they only receive small support and favourable conditions (Ardic, Mylenko & Saltane 2012, Khan et al. 2012). Evidence suggests that the SME may exist through the effort of an individual, but the growth is not solely dependent on the entrepreneur (Nichter & Goldmark, 2009). However, business research studies on SMEs are showing bottlenecks to the SMEs' expansion in Bangladesh.

Historically the lack of banking and finance is the major constraint to the SMEs' growth in Bangladesh (Ahmed 2006, Harvie 2004). SMEs need financing in different stages of their business. SMEs need finance for initial capital, working capital and reserve capital for unexpected contingencies. However, lack of these finances for SMEs in Bangladesh is a bottleneck to the SMEs' growth and sustainability (Ahmed 2006, Chowdhury 2007, Miah 2007).

Unavailability of modern technology and lack of ICT access are another major constraint for the rural SMEs in Bangladesh. Being small in regards to finance and human resource, rural SMEs are not benefitted by using ICT (Ahmed 2006, Mintoo 2006, Chowdhury 2007, Miah 2007). Therefore, SME owners and employees should be

offered banking, education and health services via mobile phone, as mobile phone adoption is high in Bangladesh.

Rapid liberalisation, dependence on importing consumer goods and lack of separate policy for small business has put native SMEs in severe strain. However, for the future, to achieve the committed Millennium Development Goals (MDG) of 2015, the development process of Bangladesh must strive towards the improvement of SMEs, especially the rural SMEs (Mahmuda et al. 2010).

2.4 Bangladesh banking sector

The Bangladeshi banking sector consists of banks, insurance companies, micro finance organisations and cooperative societies (Ahmad & Khanal 2007). Bangladesh Bank (BB) is the central bank. The typical roles of Bangladesh Bank are formulation and implementation of banking policy. Another important task is managing the financial institutes and their operations.

Banks are the dominator in the financial sector of Bangladesh. The banking industry consists of four categories of banks: state owned banks, finance institutions, private banks and foreign banks (see Table 2.3 for more details). However, private banks have gained significant success in poverty alleviation, loan disbursement and innovative banking systems. Bangladesh Bank (2013) reports banks are far ahead in total assets and deposit collection. Currently, 52 banks with are operating in the country. However, besides the formal banks, huge number of informal banking systems are available in Bangladesh (Bangladesh Banks 2013).

Table 2.3: Structure of banking industry in Bangladesh

Bank Types	No of banks	No. of Branches	% of Assets
State-owned commercial banks (SCBs)	4	3386	31.1
Development financial institution (DFIs)	5	1362	6.7
Foreign Commercial banks (FCBs)	09	56	8
Private commercial banks (PCBs)	30	2082	54.2
Total	48	6886	100

Source: Annual report, BB, 2008-2009

2.4.1 Banking arrangements and finance of the SMEs in Bangladesh

SMEs in Bangladesh are provided banking by the Bangladesh Bank, donor organisations such as ADB, International Development Agency (IDA), the World Bank's Enterprise Growth and Bank Modernization Project (EGBMP) and non-government organisations (NGOs). International donations in Bangladesh are as loans to the SMEs by government banks and private banks. Small and micro credit from microcredit financiers and NGOs are also available for SMEs, especially for the rural SMEs. However, NGOs' finance is always not enough, thus less effective (Chowdhury 2007).

However, the traditional banks require the client to provide identification and business documents to open an account. But the informal nature of SME business and sometimes the inability to supply business documents puts SMEs at a disadvantage in the formal banking system (Khan et al. 2012). Moreover, SMEs are not attractive clientele to the traditional banks because of their low capitalisation, insufficient assets and their inability to comply with collateral requirements. The rural SME banking situation is even more severe. Rural SMEs can only bank with the government banks but government banks are less SME focused. Thus, like many developing countries, Bangladeshi SMEs are unbanked or deprived of sophisticated banking facilities.

2.5 ICT ecology in Bangladesh

Bangladesh has achieved remarkable achievements in IT adoption. A good deal of enthusiasm for IT prevails in Bangladesh in both government and private sectors. Government and non-government organisations, banks and the central bank have considered IT as a driving tool for business development and socioeconomic development. Tremendous activity is going on in every sector including e-commerce, e-governance, computer networking, Internet, web browsing, web applications,

multimedia product development etc. However, the country has received most success in mobile phone adoption, which is the first technology of many Bangladeshis.

The Bangladesh government has also come forward in IT adoption by declaring IT as a thrust sector. The present government has undertaken a number of initiatives to introduce new policies, programmes and regulations to create a vibrant ICT sector. Government also aims to setup a computer training centre in each divisional and district headquarters. Government declared the import of computer hardware and software a duty free item. Recently in Bangladesh, the 3G network has been introduced, VSAT is deregulated, and a high speed DDN (Digital Data Network) has been introduced.

2.5.1 Landline telephone subscribers in Bangladesh

However, fixed line use has not experienced any massive change. Despite government initiatives such as accelerating the connection process to the applicant's residence, lowering the call charge, improving the service from analogue to digital, the growth is not impressive. The total number of landline phone subscribers has reached 1028.19 thousand at the end of May 2010. The landline phone subscribers are shown in table 2.4.

Table 2.4: Landline phone subscribers

Operators	Subscribers
BTCL	872.41
Telebarta Ltd.	56.42
Jalalabad Telecom Ltd.	10.90
Onetel Communication Ltd.	39.57
Westec Ltd.	17.00
Sheba Phone Ltd. (ISL)	11.62
S. A. Telecom System Ltd.	18.03
Banglaphone Ltd.	2.24
Total	1028.19

*Subscribers in Thousands

**The above subscribers' numbers are declared by the PSTN operators

2.5.2 Internet subscribers in Bangladesh

The Internet was introduced in 1996 by the ISP provider ISN (Ali et al. 2007, Alam et al. 2007). As of now, Bangladesh Telecommunication Regulatory Commission (BTRC) has about one hundred and sixty-six (166) registered ISP licence holders and there are approximately four hundred and fifty thousand (450,000) users connected to them which represents about 0.32% of the total population. The total number of Internet subscribers has reached 35,631.269 thousand at the end of June 2013 (see Table 2.5 and Figure 2.2 for more details).

Table 2.5: Internet, and broadband users and subscribers

Source: ITU database

Category	Subscribers
Mobile Internet	33904.841
ISP + <u>PSTN</u>	1221.62
<u>WiMAX</u>	504.808
Total	35631.269

* Subscribers in Thousands

**The above mentioned figure represents the number of Active subscribers only.

2.6 Mobile phone industry in Bangladesh

In 1989, the mobile phone industry started operating; the first licensee was Pacific Bangladesh Telecom Ltd for mobile phone network operation in collaboration with a Hong Kong based company (Bhuiyan 2004). In 1993 it changed its brand and renamed as Citycell and continued its monopoly until 1996, when the government issued licences to another three more companies; GrameenPhone (GP), AKTel and Sheba Telecom (now Banglalink) (Bhuiyan 2004, Eusuf, Toufique & Shamannay 2007). In 2004 Sheba sold its 100% to Egyptian giant OrascomTelecom (now Global Telecom Holding). Orascom started operations in 2005 under the brand name Banglalink. Later, two other mobile operators Teletalk and Warid were issued licences in 2004 and 2005 respectively. However, Warid sold a majority stake to India's Bharti Airtel Limited and renamed the business as Airtel. Teletalk is the publicly owned mobile operator running under BTTB (Eusuf, Toufique & Shamannay 2007).

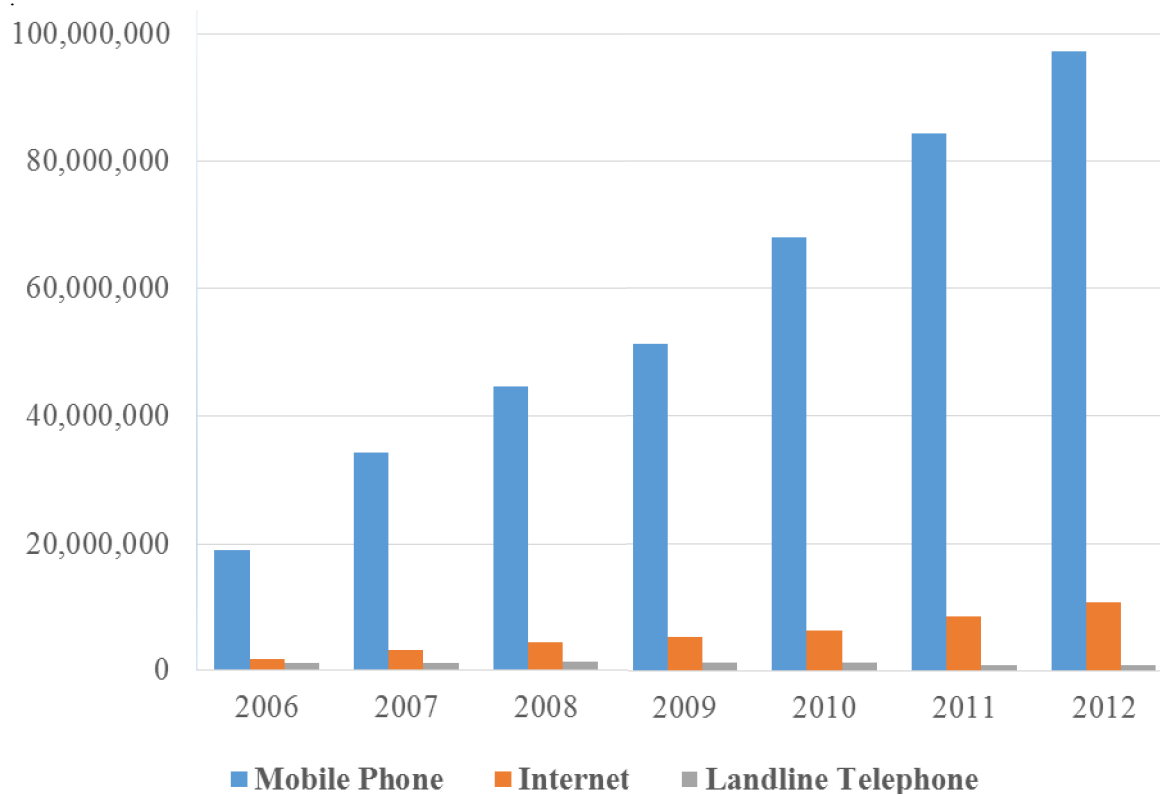
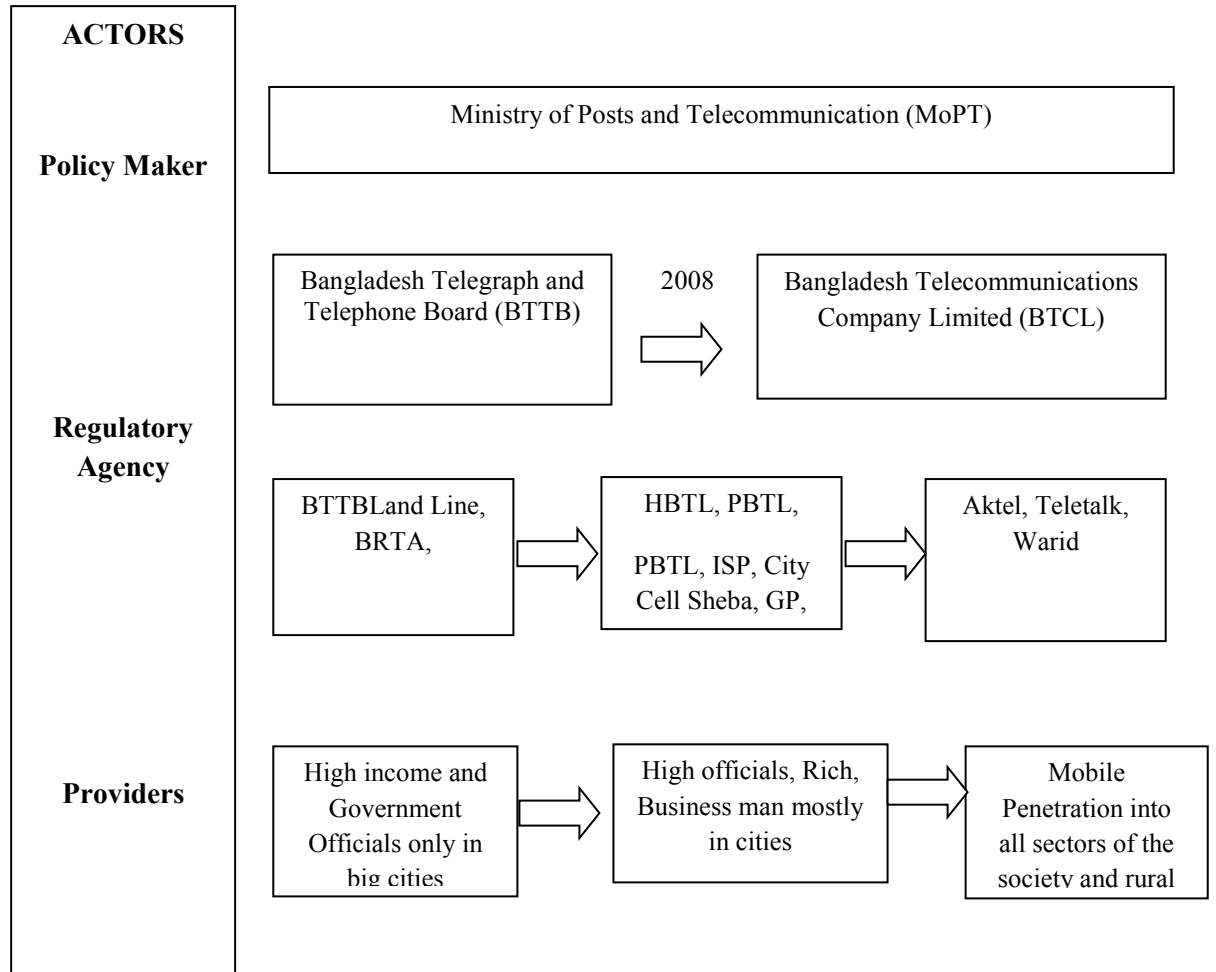


Figure 2.2: Total Telephone, Fixed line and Mobile

Source: <http://www.telecompaper.com>

2.6.1 Mobile phone industry regulators in Bangladesh

In Bangladesh the mobile phone industry consists of the Ministry of Posts and Telecommunication (MoPT), Bangladesh Telecommunications Company Limited (BTCL) and Bangladesh Telecom Regulatory Commission (BTRC). However, the industry is run under the Ministry of Posts and Telecommunications (MoPT) (BTTB 2006, Islam & Rahman 2006)(see Figure 2.3 for more details). Presently, the role of the MoPT, BTCL and BTRC are clearly assigned: policy matters are vested with the MoPT, telecom services are provided and the systems of operation are maintained by the BTCL and other private operators, while the regulatory functions are assigned to the BTRC (Bhuiyan 2004).



Phase 1	Phase 2	Phase 3
Monopoly by Government institute.	Establishment of frameworks, deregulation, entrance of providers	Huge competition on telecom market, Exponential growth
No presence of telecom growth		

Figure 2.3: Mobile Industry analysis in Bangladesh

2.6.2 Mobile phone subscribers in Bangladesh

In terms of telephone communication, mobile phones have become the choice of the majority. The total number of mobile phone subscribers has reached 106.934 million at the end of July 2013 (BTRC 2013) (see Table 2.6 for more details).

Table 2.6: Mobile phone subscribers in Bangladesh

Operators	Active Subscribers
Grameen Phone Ltd. (GP)	44.666
Banglalink Digital Communications Limited	27.324
RobiAxiata Limited (Robi)	23.770
Airtel Bangladesh Limited (Airtel)	7.897
Pacific Bangladesh Telecom Limited (Citycell)	1.361
Teletalk Bangladesh Ltd. (Teletalk)	1.916
Total	106.934

*Subscribers in Millions

**The above subscribers' numbers are declared by the mobile operators

2.7 IT adoption and usage in Bangladeshi banks

Like many other countries, the advent of Information Technology (IT) has revolutionised banks in Bangladesh. IT adoption in Bangladeshi banks started with the installation of a second generation computer in 1964. However, in Bangladesh, foreign banks and private banks played the leading role with adoption of IT in banking (Islam & Rahman, 2006, Rahman 2001). Currently Bangladeshi banks offer ATMs, e-banking, online banking and m-banking facilities to the customers.

2.7.1 IT adoption phases in Bangladeshi banks

The IT adoption phase in Bangladesh can be divided into four sections as shown in figure 2.1. From 1971 to 1980, Bangladeshi banks did not offer any IT service to the consumers and branch banking was only the banking option. In the second phase, the

foreign banks and private banks started computerising their branches for communication exchange and back-office activities. In the early stages, banks mainly used computers for accounting, payroll applications, ledger maintenance, cash management and dispenser (Chowdhury 1999, Khalil, Ahmed & Khan 2007). The third phase was characterised by ATMs, offline transaction processing and inter-bank fund transfer. The fourth generation services offered real time online banking, electronic fund transfer, centralised processing at country level, e-banking and m-banking (Alam et al. 2007, Rahman 2012). The fourth phase is the most sophisticated stage as money transfer using e-banking and m-banking is possible with the permission of the Central Bank (see Figure 2.4 and Table 2.7 for more details).

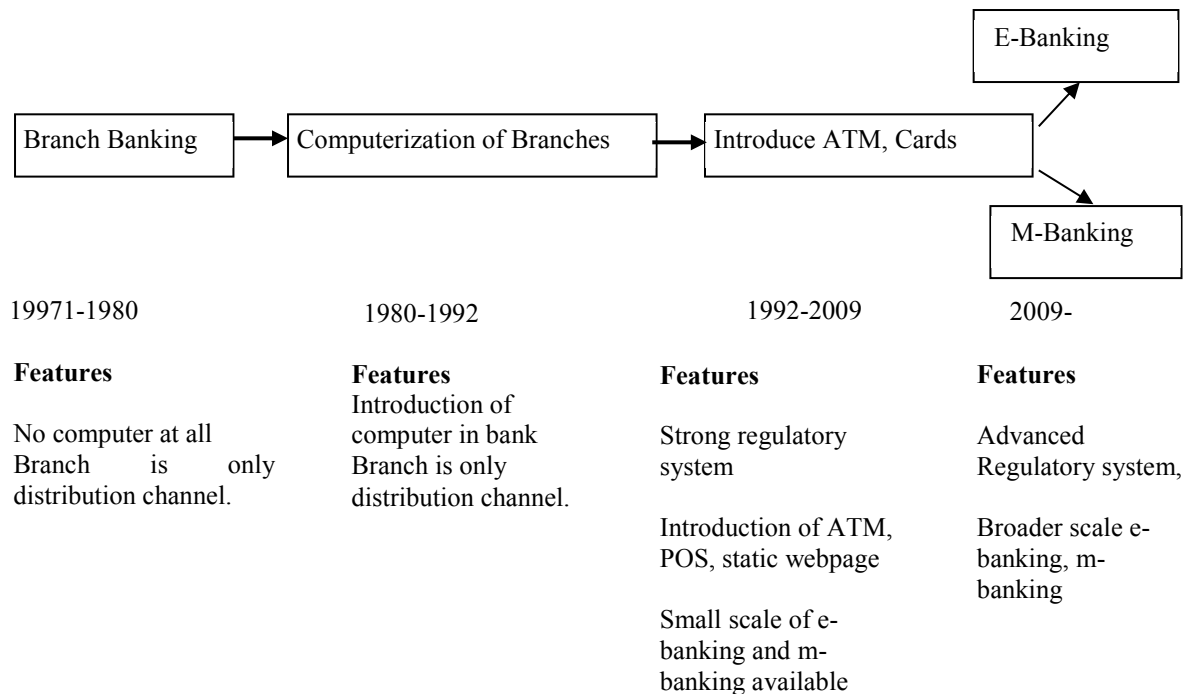


Figure 2.4: Technology Diffusion in Bangladesh

The adoption of IT has clearly divided Bangladeshi banking into several categories. Firstly, foreign banks and most of the private banks; secondly, a few new private banks offering medium range online banking systems; and thirdly, nationalised banks and a few foreign bank branch offices that have very limited online systems.

Table 2.7: E-banking facilities in Bangladesh

Facilities		Government banks	Private banks	Foreign banks
	E-banking	4	11	9
	SMS banking	5	17	9
	Computerized Branches	45	28	9
	Website	4	35	9

2.7.2 The Central Bank's activities and initiatives

Bangladesh Bank has a great role in IT adoption within the banks of Bangladesh. Bangladesh Bank mainly formulates policy and ensures the implementation of the policy. However, Bangladesh Bank also develops IT systems for government owned banks. Bangladesh Bank also develops IT systems that are useful for all the banks, such as Treasury Management System, import monitoring, export form matching, credit information applications, payroll, Human Resources Management System etc. These applications are supported financially by the donor organisation such as the Asian Development Bank, World Bank and DFID. The recently developed Bangladesh Automated Cheque Processing System (BACPS) and Magnetic ink character recognition applications have been highly acclaimed by the Bangladeshis. So far sixty (60) different in-house applications have been developed and are in operation, eighteen (18) applications are in development/implementation stage.

2.8 E-banking in Bangladesh

Internet banking has received increased attention over the last few years in Bangladesh among the private banks and international banks. In Bangladesh the banks started their e-banking journey by developing an informational website to gain an Internet presence. Embracing e-banking increased their image among consumers during last few years. Despite the huge diffusion of e-banking in the world, the status of e-banking is not promising in Bangladesh (Rahman et al. 2009, Alam et al. 2007). The main customers of e-banking in Bangladesh are the rich, educated and urban customers.

2.8.1 E-banking adoption challenges in Bangladesh

Research suggest adoption of e-banking in Bangladesh faces various challenges (Imran 2009, Raihan 2001). Like other developing countries the expansion of e-banking in Bangladesh is beleaguered with several infrastructural, institutional and regulatory constraints (Rahman 2007). The main obstacles of e-banking adoption in Bangladesh are issues such as high price of computers, high cost of Internet and unavailability of Internet in rural areas (Ali et al. 2007, Khanam, Ahmed & Khan 2005, Raihan 2001). Some cognitive factors such as lack of knowledge, attitude, low level of computer literacy among users, and requirement of huge investment to buy a computer also play a negative role in e-banking adoption in Bangladesh (Imran 2009).

2.8.2 Recommendations to overcome e-banking challenges in Bangladesh

To overcome the challenges of e-banking in Bangladesh, various recommendations are suggested by the local - researchers and ICT practitioners (Rahman 2009, Ali et al. 2007). However, Rahman (2009) suggests an alternative channel of banking distribution. He argues that mobile banking can be an important tool in Bangladesh for two reasons: mobile banking covers almost all activities involved in retail banking; and secondly, the mobile phone network has already been spread all over the country. Researchers also suggest that mobile banking is a good and possible alternative to offer electronic banking opportunity.

2.9 Conclusion

Since this research is a context specific study focused on Bangladesh, it is essential to explain the situation of the research context and to provide a broad range of information related to the topic of the thesis in the context of Bangladesh. This chapter therefore has introduced demographic information on Bangladesh, SMEs in Bangladesh, banking in Bangladesh and Information Technology in Bangladesh, particularly within the banking sector. The next chapter presents the m-banking literature review.

Chapter 3

M-banking: An opportunity for SMEs

This chapter provides a theoretical foundation for the research by reviewing the most significant relevant literature that impacts on the research questions. This chapter starts by providing a definition of m-banking from previous studies, then the discussion proceeds to m-banking in Bangladesh. M-banking has several benefits to offer SMEs, banks and telcos. This chapter examines the benefits and advantages of m-banking from previous research. Micro level customer perspective factors and macro level m-banking factors and how these factors impact positively and negatively on m-banking implementations are also presented. A section explores the barriers in m-banking that prevent customers from using the service. The literature review includes those aspects of m-banking that are expected to determine the m-banking framework for rural SMEs in Bangladesh. The review does not consider technological aspects like programming language, network protocol, secure architecture of m-banking; rather customer perspective factors, organisational factors and country level factors are considered. Studies and literature related to research methodology are included in Chapter Four.

3.1 Introduction

Over the last two decades the world has witnessed a massive boom in mobile phone adoption. The rapid diffusion of mobile phones sparked the idea to utilise the mobile phone network for more than voice and SMS communication (Beth 2008). Researchers and ICT practitioners suggested to offer various services such as banking, education and commerce using mobile phones to the users. Among these services, the banking service over the mobile phone, commonly known as m-banking, excited government, banks and MTOs especially in the developing countries where banking excludes poor and rural customers.

M-banking enables people to use their mobile phones to manipulate their bank accounts linked to their mobile phone number and transfer money. The European banks first implemented m-banking as an extra channel on top of existing banking channels for more convenience to the customer. However, m-banking has proven to be more advantageous for SMEs in developing countries too. Therefore, it is now at the centre of intense national interest for SME banking in countries like South Africa, Kenya, Philippines, India and more recently, in Bangladesh.

3.2 Defining M-banking

The terms m-banking, m-money, m-payments and m-finance are generic terms that refer collectively to the service that enables banking using a mobile phone (Brown et al. 2003). However, m-banking is limited in this research to an application that allows users to complete banking transactions using only the Short Message Service (SMS). In this definition, SMS is considered the sole channel for m-banking, as only SMS-based m-banking is available in Bangladesh now. This is the main difference to other m-banking definitions in Table 3.1. Some popular definitions of m-banking are given in Table 3.1.

Table 3.1: Definitions of m-banking

Study	Definition
Punithavathi & Duraiswamy (2011)	M-banking systems are applications that allow users to complete banking transactions on a mobile device
Bangens & Soderberg (2008)	A financial service delivered by mobile networks using mobile phone.
Porteous (2006)	A subset of e-banking in which customers access a range of banking products, such as a variety of savings and credit instruments, via electronic channels.
Martinez & Chaparro (2005)	The system that uses mobile information and communication technology in order to provide access or delivery to the information system.
Mallat, Rossi & Tuunainen (2004)	The mobile financial applications are called m-banking.
Barnes & Corbitt (2003)	A channel whereby customer interacts with a bank via the mobile device or personal digital assistant (PDA).
Salvi & Sahai (2002)	A system where a subscriber would be able to perform monetary transaction anytime, anywhere and with anyone using his mobile.

3.2.1 Models of m-banking

A wide spectrum of m-banking models has evolved in various countries. M-banking can be categorised based on the bank's/Telco's involvement and the initiatives taken by the organisations (Porteous, 2006). The responsibility of the deposit collection, deposit disbursement using outlets and payment instruction, and the most exposed brand to the public also define the classification of m-banking. The two most referenced m-banking models in previous m-banking research studies are the bank-led and Telco-led. However, bank-Telco joint ventures and non-bank/Telco driven m-banking service such as Globe and Celpay also exist (Ivatury, Gautam, & Mas 2008).

3.2.2 Technology in m-banking

M-banking mainly uses SMS (Short Message Service) technology and WAP (Wireless Access Protocol). The SMS-based banking is the most accepted technology in the world, as the majority of phones have SMS capabilities, but only 10% have WAP capability. SMS is less expensive than WAP. The first m-banking services started by European banks used WAP technology. South Africa was also using WAP to provide m-banking. Among other technology, i-mode platform that is based on cHTML (compact Hypertext Markup Language) or Java technology is also dominant in Japan (Brown et al. 2003).

3.3 M-banking in Bangladesh

With 75 million mobile phone users, 45% unbanked population, and 99% of the population within the mobile network (BRTC 2013, CIA 2013), Bangladesh has encouraged the banks, telecoms and the Central Bank to come forward in the introduction of m-banking. Furthermore, the latest initiative of the Central Bank to offer banking service to the unbanked population has also sparked the impetus towards m-banking adoption.

M-banking was first introduced as Short Message Service (SMS) banking by the private banks in Bangladesh. The early m-banking services in Bangladesh had very limited functionality, such as viewing own account details, balance and mini statement.

However, with the deregulation of policy on 29 November 2009, current m-banking services in Bangladesh offer cash-in, cash-out, fund transfer for merchant payment, salary disbursement and utility payments (Ahmed, Rayhan & Islam 2011, Rahman 2012).

3.4 Past, present and future: Research on m-banking

The preliminary investigation suggests that m-banking has gained great interest in the research community worldwide as it is expected to have an impact in developing countries (see Figure 3.1 for more details). Existing m-banking research studies can be categorised into three broad areas of study:

Firstly, some groups of researchers explain the diffusion of m-banking at the individual level. This is the customer perspective research that concentrates on adoption, acceptance and usage of m-banking (Brown et al. 2003). The researchers use various Information systems theories such as classic Diffusion of Innovations Theory (Roger 1995), Technology Acceptance Model (TAM) and the extended TAM (Davis 1989), the Theory of Planned Behaviour (TPB) (Taylor & Todd 1995) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al. 2003) to predict the adoption of m-banking by individual customers (Donner 2008). This is the most popular topic in m-banking research.

Secondly, some research assesses the impact of m-banking at the organisational level and tries to understand the use of the m-banking system in the organisation. A major shift here is from the personal use of m-banking to the business use of m-banking. Recently some m-banking studies have focused on m-banking use in the SMEs (Bångens & Söderberg 2011, Higgins, Kendall & Lyon 2012, Kirui, Okello & Nyikal 2010, Kirui, Okello & Nyikal 2012, Kumar, Martin & O'Neill 2011). These researchers are convinced that m-banking has the potential to offer low cost virtual bank accounts to the large number of unbanked SMEs (Bångens & Söderberg 2011, Chavan et al. 2009, Higgins, Kendall & Lyon 2012, Kumar, Martin & O'Neill 2011). Therefore, it is

suggested that the banks can target SME owners as a user group, since SMEs' retail payment is surprisingly high (Bångens & Söderberg 2011).

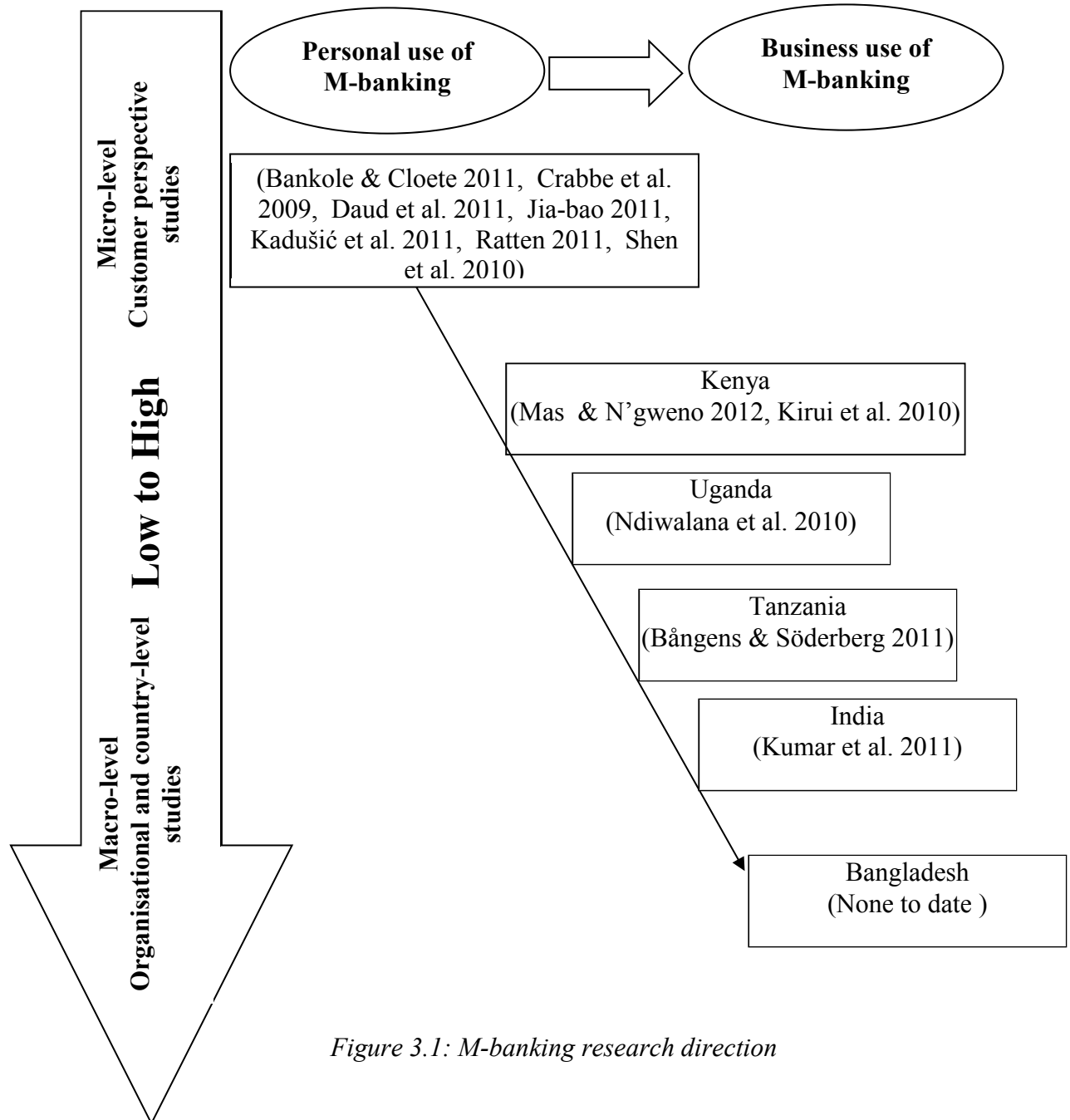


Figure 3.1: M-banking research direction

The third group presents the macro-level regulation, organizational and country-level factors. Continents like Africa, countries like Kenya, Uganda and Philippines and specific groups are put under the lens of m-banking to understand how m-banking can bring benefit to them (Aker 2010).

The preliminary investigation suggests Bangladesh has also become an attractive place for m-banking research like many other underdeveloped countries. Most of the customer perspective research studies report that consumers are favourable to m-banking in Bangladesh (Ahmed, Rayhan & Islam 2011, Dewan & Dewan 2009). On another dimension, the macro-level m-banking research studies in Bangladesh mainly examine the national payment system, the m-banking regulation and m-banking transaction policy in the country (Sultana 2009). The studies report that the Central Bank and the government are supporting the banks and MTOs with m-banking implementation by introducing new regulations related to m-banking and reforming the banking policy.

However, Bangladeshi m-banking research studies are dominated by the customer perspective adoption studies (Ahmed, Rayhan & Islam 2011, Dewan & Dewan 2009). These studies are mainly conducted in big cities and conducted from person-to-person usage. Existing research efforts on m-banking in Bangladesh focused on the technology perspectives too (Ahmed, Rayhan & Islam 2011, Dewan & Dewan 2009, Mousumi & Jamil 2010). However, it remains to be investigated how micro and macro-level factors both impact on m-banking adoption for rural SMEs in Bangladesh. M-banking service is new in Bangladesh and still in its infancy, leaving a great deal of room for development.

3.5 M-banking advantages

Over the last ten years, m-banking has gained great interest in the research community worldwide as it is expected to have an impact for developing countries. Scholars suggest that for developing countries, m-banking can reduce ‘walking many kilometres for the banking’ (Medhi, Ratan & Toyama 2009) and m-banking is a panacea for the poor (Aker & Mbiti 2010, Dunmcombe & Boateng 2009). In Kenya, the Philippines and Zimbabwe, money transfer is one of the reasons for the huge uptake of m-banking (Medhi, Ratan & Toyama 2009). In the case of WIZZIT in South Africa, employment is the reason for the uptake of m-banking as workers had to have the m-banking account for salary purposes (Medhi, Ratan & Toyama 2009). Furthermore, the emerging m-

banking is an opportunity to leapfrog the earlier stage of development and minimise the digital divide between developed countries.

M-banking has enormous potential to include the unbanked and rural customers. In developing countries, these customers are not attractive clients and considered as unprofitable to the traditional banks (Mallat, Rossi & Tuunainen 2004). However, m-banking has the potential to offer low cost virtual bank accounts to the large number of unbanked individuals worldwide (Bangens & Soderberg 2008, Medhi, Ratan, & Toyama 2009). Another interesting case by Chavan et al. (2009), suggests that m-banking can drive financial inclusion for women too, who are at the bottom of the social pyramid in developing countries. This is because in developing countries, women are not encouraged to go out to do banking due to cultural, social and or religious barriers.

At the national level, m-banking's inclusion of the unbanked population in the banking channel will benefit a country by allowing more money into the formal banking system. M-banking fosters urban to rural remittances (Morawczynski 2008) which can control unhealthy urban migration. M-banking encourages customers to investment that is not currently in effective circulation. Indirect impacts like increased family savings rate, increased income and resilience to financial shocks are also some benefits (Medhi, Ratan & Toyama 2009). Thus Aker & Mbiti (2010) suggest a link of economic development of a country and m-banking.

3.5.1 M-banking advantages for the providers (banks and MTOs)

M-banking offers strategic advantages to banks and mobile telecommunication providers too. M-banking can be a source of revenue for banks/MTOs by accessing new customers (Kim, Shin & Lee 2007, Scornavacca & Barnes 2004, Tiwari & Buse 2007). For mobile network operators, m-banking can earn revenue besides voice communication and SMS (Dolan 2009). The service also increases the brand image of the organisations leading to enhanced product (Liou 2008, Eusebio & Stuart 2004). Nah, Siau and Sheng 2005 suggested m-banking is also a medium to disseminate organisational information and to conduct marketing (Riivari 2005).

3.5.2 M-banking usage and advantages for the SME

Over the past two decades there has been a growing impetus worldwide towards the adoption of m-banking for the unbanked population. The small and medium enterprises (SMEs) are part of this unbanked sector, deprived of sophisticated banking facilities while playing a major economic role in the developing countries (Ardic, Mylenko & Saltane 2012, Beck & Demirgüç-Kunt 2006, Harvie 2004, Levy 1993, Nichter & Goldmark 2009).

Primarily, SMEs in India, Kenya and Tanzania have received most of the attention by the m-banking researchers. These studies meticulously analyse various payment systems between SMEs to SMEs, SMEs to customers and customers to SMEs in developing countries and answers the question of how the business version of m-banking should be developed. This is because m-banking acceptance greatly depends on how this service meets the banking needs of the target market. Banking requirements and patterns of money management of the target market need to be explored to make m-banking effective for them. Analysis of financial needs, aspects of financial service behaviours and the preferred financial service among the poorest users is lacking in the research of m-banking.

Previous m-banking studies have suggested SMEs in Uganda (Ndiwalana, Morawczynski & Popov 2010), Tanzania (Bångens & Söderberg 2011) and Kenya (Mas & N'gweni 2012) have benefitted substantially from using m-banking. The benefits reported by the SMEs of using m-banking are security, efficiency, and the time saving quality of m-banking. M-banking in these countries is used by SMEs to pay suppliers, receive customer deposits and to settle trades with wholesalers (Ndiwalana, Morawczynski & Popov 2010). M-banking also fosters SMEs' business by speeding up transactions, quick ordering and arranging shipments. The most interesting contribution of SMEs' m-banking use is the adoption of the service in the supply chain of the SME business. This record keeping feature of m-banking is also useful in accounting, SMEs' business management, and for the credit reference bureaus.

Lastly, research suggests that m-banking can be used for both micro-payment and macro-payment in small organisations where EFTPOS is not available (Nah, Siau & Sheng 2005). The micro-payment method can facilitate the inter-country business transactions (Mallat, Rossi & Tuunainen 2004).

Nevertheless, the extant literature on m-banking has focused on m-banking advantages for person-to-person use, whereas research analysing m-banking use by SMEs remains inadequate. The main motivation to conduct this research is that the knowledge gained from other countries' m-banking studies on SMEs cannot be applied in the Bangladeshi context. This is because SMEs are different from country to country (Higgins, Kendall & Lyon 2012). Bangladeshi SME owners may not have similar level of technological knowledge, banking knowledge and money management style to other countries' SME owners. Moreover, the business environment, banking and transaction system of the SMEs in Bangladesh may not be the same as other developing countries. Furthermore, most of the m-banking advantages for SMEs are documented from an SME's perspective. To date, no research from Bangladesh or other parts of the world have collected data from a bank or MTO's perspective.

In a country like Bangladesh where SMEs provide the second source of national income and the only option in the non-harvest season, no research has answered the question:

- 1. What benefits can be achieved for the rural SMEs, banks, telecommunication organisations and the government by offering m-banking to the rural SMEs in Bangladesh?*

3.6 Micro and Macro factors in m-banking

Micro-level customer perspective studies and macro-level organisational and country-level perspectives are two major dimensions in m-banking research (Bankole & Cloete 2011, Daud et al. 2011, Jia-bao 2011, Kadušić, Bojović & Žgalj 2011, Ratten 2011, Shen et al. 2010). However, the most popular topic in m-banking research is the customer perspective that concentrates on adoption, acceptance and usage of m-banking (Brown et al. 2003).

3.6.1 Micro-level factors

Over the last ten years, a wide spectrum of m-banking frameworks has emerged in various countries. Frameworks are pivotal for the explanation of the factors and determinants of m-banking (Brown et al. 2003). They include consumer, technical, social, and security perspectives and apply Information Systems (IS) adoption theories to explain the individual's preference and reaction. M-banking, like any other IS application, has strong linkage to the customer's behaviour, perception and motivation. Traditionally IS has a strong relation to the individual's preference and reaction (Goodhue & Thompson 1995). The most popular IS theories in m-banking research are the classic Diffusion of Innovations Theory (Roger 1995), Technology Acceptance Model (TAM) and the extended TAM (Davis 1989), the Theory of Planned Behaviour (TPB) (Taylor & Todd 1995) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al. 2003). These theories concentrate on individual needs, user characteristics, and consumer behaviour and describe sociological factors (Donner 2008). Bankole and Cloete (2011), Daud et al. (2011) and Kadušić, Bojović & Žgalj (2011) have used IS theories in developing an m-banking framework. In some cases, the researchers extended the actual model or combined two models to explain the possible adoption and acceptance patterns (Tobbin 2012).

The TAM has received significant attention in m-banking research. Over the years, TAM has received praises from earlier researchers on its contribution towards our understanding into consumer behaviour. Relative advantage, perceived compatibility, trialability and consumer banking needs and lower perceptions of risks are some factors identified in m-banking in South Africa (Brown et al. 2003). Crabbe et al. (2009) identified usefulness, ease of use, perceived elitisation, credibility, facilitating conditions, sustained usefulness and demographic factors are playing in Ghanaian mobile banking users. However, most common factors cited in previous m-banking studies are listed in Table 3.2.

However, Luarn and Lin (2005) argue volitional as TAM's limitation and added two new constructs: perceived self-efficacy and perceived financial cost, adapted from perceived behavioural control of TPB. The researchers further say that TAM misses the

important sources of variances in m-banking context; so another construct of perceived credibility that relates to adopters' trust of the service, proposed by Wang, Lin & Luarn (2006) from the internet banking context is added. The researchers claim that usefulness, ease of use, credibility and self-efficacy influence intention of m-banking use and financial cost of the service negatively influences intention. Wang, Lin & Luarn (2006) used TAM, TPB and Luarn and Lin (2005) and found self-efficacy, financial resource, usefulness, ease of use and credibility influence intention to use m-banking.

Table 3.2: Drivers in m-banking research

Authors	Study/ Model	Drivers	Country & Method
Brown et al. (2003)	Tan and Teo 2000	Relative advantage, Compatibility, complexity, triability, banking needs, risk, internet experience subjective norms, self-efficacy and facilitating conditions.	South Africa Survey
Suoranta & Mattila, (2003)	Bass model	Socio economic factors	Finland Survey
Kleijnen et al. (2004)	Extended TAM	Usefulness, ease of use, cost, system quality, social influence, user characteristics: age, computer skills, mobile technology readiness	Field survey of 105 mobile banking users
Luarn & Lin (2005)	TAM and TPB	Perceived usefulness, perceived ease of use, perceived creditability (Wang et al 2003), perceived self-efficacy (TPB), perceived financial cost (TPB)	Taiwan
Laukkanen & Lauronen, (2005)	Customer perspective value	Convenience, time savings, efficiency, ability to react immediately, location free service, safety, self esteem	
Wang, Lin & Luarn 2006	Tam, TPB and Luarn & Lin (2005)	Self-efficacy, Financial resource, Usefulness, Ease of use, Credibility	Survey of 258 Taiwan
Zhou, Lu & Wang (2007)	TTF & UTAUT	Task characteristics, Technology characteristics	
Hong et al. (2008)	TPB	Usefulness, ease of use, enjoyment, social influence, media influence, mobility, monetary value	Online survey of 811 Hong Kong
Morawczyński & Miscione (2008)	Trust	Trusts towards agents and service providers	Kenya Ethnographic
Crabbe et	TAM	Perceived elitisation (Venkatesh and Davis 2000),	

al. (2009)		perceived credibility(Luarn and Lin 2005) , facilitating conditions(Taylor & Todd, 1995), sustained usefulness and usage (Chau, 1996), Demographis factors (age, gender and education)	
Chu & Yao bin (2009)	Trust Transfer	Personal factors (trust propensity), cognition-based factors (relative advantage, compatibility), institutional factors (structural assurance, firm reputation)	Online survey 313 China.
Tobbin (2009)	TAM and IDT	Perceived usefulness, perceived ease of use, perceived risk, perceived trust, transactional cost, triability.	Ghana
Chung & Kwon (2009)	Delone and McLeans (1992 2003) Systems Quality	Systems quality, Information quality Information presentation and Trust	Korea, Survey
Lee & Chung (2009)	Delone and McLeans (1992)Syst ems Quality	Systems quality, Information quality Information presentation and Trust	Korea
Barati and Mohamma di (2009)	TAM, UTAUT Innovation resistance	Demographic factors, Innovation resistance, Perceived usefulness, perceived ease of use,	Conceptual
Liu, Min & Ji (2009)	TAM and trust	Trust in technologies, Trust in vendors, Structural assurance, Disposition to trust, Perceived usefulness, perceived ease of use,	China Survey 438
Luo et al. (2010)	Performanc e expectancy, Trust and risk	Structural assurance, Disposition to trust , self-efficacy, trust belief, financial, performance, privacy, time, psychological, social, physical risks and overall risks	US survey
Kim, Shin & Lee (2009)	Trust	Relative benefits, Personal Propensity to trust, structural assurance and firm reputation	Korea Survey
Wessels & Drennan (2010)		Demographic factors, Perceived usefulness, perceived ease of use, Need for interaction, perceived risk	Web based survey, Australia
Ying & Can (2010)	TAM	Consumption concept, Consumer experience Perceived usability , Perceived usefulness, Perceived ease of use, attitude, behavioural intention,	
Anus et al. (2011)	Risk and Trust	Performance expectancy, behavioural	Pakistan Survey

TAM was also extended by other researchers like Wang, Lin & Luarn (2006) and Kleijnen (2009). Hong et al. (2008) used models based on the decomposed TPB and incorporating factors. They found that attitude, social influence, media influence, perceived mobility, and perceived monetary value influence consumers' intention to

continue usage of mobile data services. Tobbin (2009) also extended TAM using IDT constructs and highlights perceived ease of use, perceived usefulness, perceived risk and perceived trust as key determinants of behavioural intention of m-banking adoption. M-banking adoption is also explained using UTAUT and TTF, as TAM is not enough to predict the individual adoption of technology (Zhou, Lu & Wang 2007, Ying & Can 2010) added three more factors to TAM: consumption concept, consumer experience and perceived usability, and verified that all these factors have influence over m-banking adoption.

The latest m-banking frameworks have more dimensions and variations of factors. For example, adoption is tested together with satisfaction (Jia-bao 2011), social cognitive factors (Ratten 2011), cost-benefit perception on adoption (Shen et al. 2010), trust transfer from online to m-banking (Wei 2011), usability comparisons between SMS banking and Interactive Voice Response (IVR) (Peevers 2011). A most recent m-banking framework examines the individual's entrepreneurial adoption decision to use m-banking (Ratten 2011). Some research also tests religious belief on m-banking adoption (Amin 2011).

Despite the fact that m-banking frameworks have been developed using data from different countries (Bankole & Cloete 2011, Laukkanen & Cruz 2012), research indicates that m-banking frameworks are highly contextual. Factors have varied effects in different regional contexts. Amin et al. (2008) report that perceived ease is an m-banking factor in Malaysia, while Daud et al. (2011) find no significant relationship. There is therefore a need to understand the adoption drivers, motivators and the factors of the users in each specific country.

Despite the huge potential of m-banking in Bangladesh, not much research effort has been devoted to identifying micro-level customer perspective factors in m-banking adoption, by comparison with other countries. Moreover, m-banking providers consider Bangladesh as a market but they do not target it as a specific market. But Medhi, Ratan & Toyama (2009) suggest that an unbanked market should be targeted to first and then answers should be given in relation to how m-banking could be adopted in that market.

Another important criticism on the m-banking research in Bangladesh is that to date, all the attempts are too technology-led (Mousumi & Jamil 2010). The researchers include business models but exclude social models. It is important to consider the technological, contextual and social perspectives on which m-banking adoption depends (Bankole 2011, Daud et al. 2011, Kadušić, Bojović & Žgalj 2011, Min et al. 2011, Yang 2011).

However, three problems are found with the customer perspective m-banking research in Bangladesh. Firstly, instead of using strong empirical evidence, the research studies are founded on a small number of participants (Duncombe & Boateng 2009). Secondly, a strong research tradition in m-banking worldwide shows that social factors have a powerful influence on m-banking adoption; but current research on m-banking in Bangladesh has not considered this socio-cultural approach. Moreover, the research studies have not considered any Information System (IS) adoption theories, but IS theories are important in explaining the adoption of IS. Furthermore, these theories have a relation to the individual's preference and reaction (Goodhue & Thompson 1995). Thirdly, the m-banking research tends to underestimate the true extent of customers' intention to use the service by narrowing cognitive factors of human behaviour. One research has attempted to predict young consumers' m-banking choice; but the research is city based, and rural settings (65% of the population) are ignored (Ahmed, Rayhan & Islam 2011, Dewan & Dewan 2009). This research is one of the earliest attempts to examine m-banking in a rural Bangladesh setting.

Another rationale for undertaking such a study is that current m-banking research in Bangladesh tends to underestimate the true extent of complex adoption factors by providing only survey based micro-level customer perspective research (Ahmed, Rayhan & Islam 2011, Dewan & Dewan 2009, Rahman 2012). Currently there is no research on Bangladesh that employs an exploratory approach to understand complex adoption factors. To extend the understanding on m-banking, there is a need to broaden the research methods, utilising more detailed qualitative studies and experimental research design. Duncombe & Boateng (2009) make a strong case that a greater number of participants in the research will strengthen the understanding of the banking needs,

and data from a wider population will provide m-banking research clarity and reliability (Duncombe & Boateng 2009).

The availability of the service alone does not ensure that SMEs will adopt the service. Predicting SMEs' intention is important. There is a need, therefore, to understand their acceptance of m-banking and to identify the drivers, inhibitors, risk, satisfaction and usability factors affecting Bangladeshi SME's intentions to use m-banking. This information can improve the building of m-banking systems that SMEs want to use, and help discovering why potential SMEs avoid using the existing system. Failure to understand any one of the factors may result in failure to capitalise on the benefits of m-banking. For Bangladesh, the failure could be severe, a step backward. Thus Bangladesh is probably one of the countries with the greatest need of research attention. To fill the current gap, this study investigates a customer perspective framework for rural SMEs in Bangladesh. The research will provide an answer to the question:

2. What are the customer perspective factors which influence the intention of rural SMEs to adopt m-banking in Bangladesh?

To provide an answer to above research question, this research conducted statistical analysis. The statistical analysis tested hypotheses which are developed in the next sections.

3.6.2 Hypothesis development

This research is established on the premises of IDT, TPB, TAM, and the m-banking framework by Luarn and Lin (2005). The research considers the customer perspective factors reported in several related works, such as factors of perceived usefulness, perceived ease of use, perceived credibility, perceived risk, cost and demographics. However, the research also contributes to the body of knowledge by introducing three new factors which impact on the intention to adopt m-banking, namely banking satisfaction, m-banking advantages for SMEs, and SME business type. These factors are

rarely mentioned in prior studies. However, the factors which were considered in this study and the hypotheses which relate to them are listed as follows and summarised in Figure 3.2.

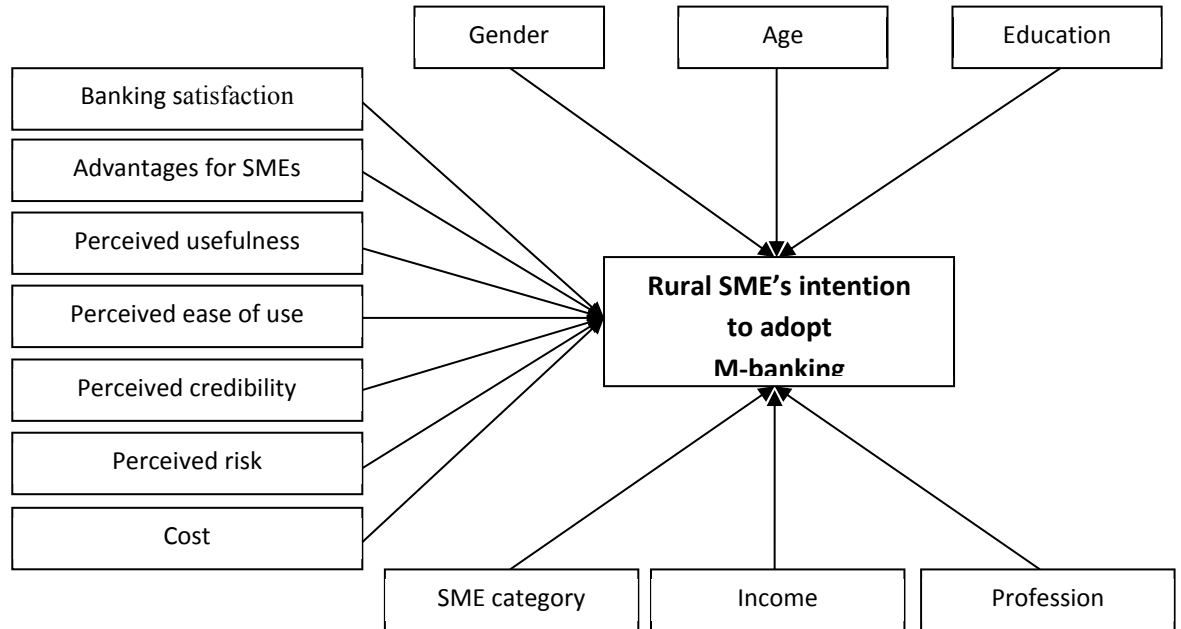


Figure 3.2: M-banking framework based on hypotheses.

Relative advantages for SMEs

Taylor and Todd (1995) define relative advantage as the extent of benefits the service offers over previous ways of performing the same task. Previous studies suggest that m-banking offers additional value, such as location-free access, real-time banking, ubiquitous purchase etc. (Brown et al. 2003, Tobbin 2009, Riquelme & Rios 2010, Jia-bao 2011). For rural SMEs, m-banking can offer easy payment, effective management and convenient banking. This forms the basis for the following hypothesis:

H2: The greater the perceived advantages of using m-banking for SMEs, the more likely that it will be adopted.

Perceived usefulness

Usefulness is the ability to enhance performance using a particular system (Davis 1989). Perceived usefulness has a significant effect on m-banking adoption (Daud et al.

2011, Luarn and Lin 2005, Min et al. 2011, Tobbin 2009). Rural SMEs will use the service if the users find it useful in saving banking time, increasing productivity, or enhancing effectiveness. The research presents a hypothesis:

H3: Higher perceived usefulness of m-banking will lead SME owners/managers to higher intention to adopt.

Perceived credibility

Perceived credibility refers to the security and privacy concerns of the users. New users of an electronic system may have concerns with the unsanctioned intrusions or outflows of personal information, fear of the lack of security and unnecessary intrusion by the system (Daud et al. 2011, Luarn and Lin 2005). Online transactions are new in Bangladesh, so it is important to know SME owners'/managers' concerns about divulging banking information online. Hence the research posits:

H4: Perceived credibility of SME owners/managers will have a positive effect on intention to adopt m-banking.

Perceived ease of use

To capitalise on the benefits of m-banking, it has to offer easy use of the system. Davis (1989) defines ease of use as the degree to which a person believes that using a particular system would be effortless. In m-banking, empirical results illustrate that perceived ease of use is related to the intention of acceptance of m-banking in non-users (Luarn & Lin 2005, Lin 2011, Min et al. 2011). This research includes the hypothesis:

H5: Perceived ease of use of m-banking will have a positive effect on the intention to adopt m-banking in rural SMEs.

Perceived Risk

Risk is at the centre of all banking transactions. Risk is defined as a consumer's belief about the potential uncertain negative outcomes from the mobile money transaction (Tobbin, 2009). Some perceived risk associated in m-banking are financial, performance, privacy, time, psychological, social, physical risks and overall risks. (Luo et al. 2010). Perceived risk was believed to be a predictor and barrier to mobile money transfer services, and expected to negatively influence consumers' behaviour (Luo et al. 2010), (Anus et al. 2011, Brown et al. 2003). Moreover, having no prior experience of electronic transactions may have a more significant negative relationship between perceived risk and behavioural intentions (Tobbin, 2009). The higher the consumer's belief regarding the likelihood of suffering a loss as a result of using m-banking, the lower the probability that they will intend to use m-banking. (Wessels & Drennan 2010). Social and physical risks are found insignificant (Luo et al. 2010, Anus et al. 2011)

H6: SME owners'/managers' greater perceived risk of m-banking will have a negative impact on the intention to adopt.

Perceived cost

In m-banking, there are some costs associated with the service, such as traffic billing, commission charges and flat fees. The price has an effect on the motivation to accept or reject the service but also perceptions of price are important for customers who have not yet tried the service (Luarn & Lin 2005, Yao & Zhong 2011). Therefore, a hypothesis is included:

H7: Perceived financial cost will have a negative effect on m-banking intention to adopt for SME owners and managers.

Demographic and socioeconomic factors

Some researchers have predicted that m-banking adoption is related to an individual's demographic status, such as gender, age and education, and to socioeconomic factors (Dewan et al. 2010, Laukkanen & Cruz 2012, Laukkanen & Pasanen 2005, Wessels & Drennan 2010). The followings are hypotheses based on these factors:

H8: Gender of the SME owner/manager will have an effect on m-banking adoption.

H9: Age will have an effect on m-banking adoption.

H10: Level of education will have an effect on intention to adopt m-banking.

H11: Occupation will have an effect on intention to adopt m-banking.

H12: SME owner's or manager's income will have an effect on intention to adopt m-banking.

H13: Business type of the SME will have an effect on the intention of the owners to adopt m-banking.

3.7 Macro-level m-banking success factors

Apart from customer perspective factors, macro-level factors also impact positively or negatively the implementation of m-banking in a country (Duncombe & Boateng 2009, Weber & Darbellay 2010). The macro-level factors are from the organisational perspective and from the country-level perspective. The following macro-level factors are identified in prior studies.

3.7.1 Ready mobile phone infrastructure

The ready mobile phone network is the main success factor for m-banking adoption in a country. Furthermore, high growth rate of mobile phone uptake, consumers' preferences of mobile phone, and continuous improvement of mobile technology provides a solid foundation for a country to offer m-banking (Cracknell 2004).

3.7.2 Supportive organisational culture to promote m-banking

Researchers suggested the organisation structure, the firm's culture, management style and brand image can promote m-banking development (Duncombe & Boateng 2009, Saleem & Rashid 2011, Weber & Darbellay 2010). More instructively, perhaps, San Martin et al. (2012) findings show that a firm's activity and technological competence affect the growth of mobile phone based commerce, such as m-banking.

3.7.3 Partnership and communication among stakeholders

Effective partnership and communication among the stakeholders are mandatory in successful m-banking (Jenkins 2008). Establishing individual and bilateral agreement among the stakeholders, setting up standards, engaging collaboratively with regulators are some identified tools to create effective partnership in m-banking (Jenkins 2008). Partnership and communication in m-banking becomes so crucial that lack of collaboration is attributed as a reason for low m-banking adoption in Europe (Pousttchi, Schiessler & Wiedemann, 2009, Ndiwalana, Morawczynski & Popov 2010).

3.7.4 Government's support of m-banking

Research identified that government and regulators' support and recognition of m-banking had prompted the m-banking diffusion in countries like Kenya, India, the Philippines and Ghana. Therefore, m-banking developers should try to place m-banking around the policy makers and regulators' objectives. Jenkins (2008) thus suggested that m-banking's placement in the World Bank's guidelines will promote m-banking to the governments of developing countries.

3.7.5 Supportive national culture to promote m-banking

Previous m-banking research studies suggest that the social and cultural environment of a country are also some unique determinants in a country that accelerates the m-banking diffusion. On this theme, Medhi, Ratan and Toyama (2009) proved social and contextual norms and practices greatly influence the money management and banking activities of the consumers. Another example, Eusebio and Stuart (2004) identified Japanese culture's tendency towards innovative use of technology and group conformity as the determinants that effectively prompted the m-banking implementation in that country (Dahlberg et al. 2008, Lio 2008)

Money sharing and financial relations are embedded in social relations and depend on social security and economic diversity. Therefore, better understanding of the daily practices, norms and use patterns of the m-banking service will allow the construction of a more valid and better m-banking service.

3.7.6 M-banking: Legal and regulatory implications

M-banking inherits the same risks as traditional banking. Therefore, m-banking development does not only depend on technological advancements, rather establishing legal certainty on the service (Bångens & Söderberg 2011, Porteous 2006, Ivatury & Mas 2008, Weber & Darbellay 2010). The following discussions explore the legal implications of m-banking.

3.7.6.1 Customer perspective regulations

Customers demand safe, affordable m-banking that is based on convincing regulatory framework (Ivatury & Mas 2008). Therefore, the adopters have a fiduciary responsibility towards the customers. Data security of customers from unauthorised access, consumer protection standards and financial integrity of the m-banking providers are some customer perspective concerns in m-banking (Weber & Darbellay 2010).

3.7.6.2 Providers' perspective regulations

Regulations are important for the m-banking providers, so that providers have confidence to invest in the necessary resources. Regulatory implication is also required to develop a dynamic m-banking market. The monopoly of the first adopters and the imbalance in market share can have negative impacts on m-banking development in a country. Therefore, Anderson (2010) had advised to develop an m-banking regulation that allows entrance of different m-banking providers and interoperability of the m-banking platform.

The participation of non-bank stakeholders such as ISP, mobile telecommunication network providers and their agents in m-banking increases the risk profile of the service. Therefore, based on the stakeholders' involvement and their engagement in money collection and disbursement, it is important to define a legal framework. The legal enforcement should address each stakeholder's responsibility on customer protections and rights, and legal provisions of involvement of different parties in the m-banking system.

3.7.6.3 National level policy and regulations

National level policies such as new account opening procedures, a national payment system, m-banking transaction policy, e-signature policy, and e-commerce policies are also important to grow m-banking in a country (Ivatury & Mas 2008). A country's supportive but flexible legislation allows a new m-banking model, as suggested by Porteous (2009). The researcher researched on four large m-banking environments; India, Kenya, the Philippines and South Africa and found strong relation between the m-banking adoption and banking and MTO regulation of those countries.

In developing countries, where illiteracy is high and financial literacy is low, the vulnerability is higher as the legal enforcement of consumer protection is often ineffective or lacking (Porteous, 2006). Furthermore, the developing countries' laws and regulations are accused of having ineffective consumer protection law. Ineffective consumer protection can vulnerable to m-banking development in the country having low literacy. Therefore, risk to customers should be exposed and the risk should be eliminated. The rising concerns of attack over the network, mobile virus, fraudulent activities, customer identification in m-banking, financial integrity of its clients and their transactions, money laundering, terrorism or criminal activities are some legal aspects that need to be addressed in m-banking regulations to gain customers' trust (Weber & Darbellay2010).

M-banking is an interdisciplinary business (Jenkins 2008, Dolan 2009), where consumers, telecoms, banks and government organisations are orchestrated in the business. This is an interesting aspect of m-banking that there is a lot to understand about the participating organisations. Therefore, more research studies are required on how the participating organisations can interact more effectively and more clearly (Mas & Ng'weno 2009).

Nevertheless, the extant literature on m-banking has focused on micro-level customer perspective factors, whereas research analysing macro-level organisational and country-level factors remains inadequate. Although some research attempted to identify the organisational and country-level factors, most of the studies focus on the consumers' standpoint (Saleem & Rashid 2011). Fewer researchers have attempted to get to the heart of the matter from the manager's perspective of a bank. The most dominant data collection strategy in the macro-level m-banking research is by using a prepared questionnaire. The questionnaire includes popular adoption factors derived from current m-banking literature. It is a conservative approach, as it limits the list of true adoption factors. M-banking research into a new market can generate new knowledge of complex factors. Research should be more exploratory by nature to uncover the latent factors in the new markets, such as Bangladesh.

Currently there is very little research in Bangladesh that discuss macro-level m-banking factors, such as organisational factors, country-level factors and national level regulatory factors. However, Duncombe and Boateng (2009) and Weber and Darbellay (2010) have suggested to consider both micro and macro-level perspectives in m-banking implementation. Furthermore, m-banking is a new way of banking in Bangladesh. Previous branch bank systems, policies and methods may not be applicable in the m-banking system. Therefore, research on m-banking instrument negotiation, banking instrument's signature and bank cheque authorisations are required. Thus Bangladesh is probably one of the countries with the greatest need of research attention. This study investigates macro-level factors in m-banking implementation in Bangladesh by answering:

3. What are the country-level and organisational factors that impact on implementing m-banking for rural SMEs in Bangladesh?

3.8 Barriers to m-banking adoption

Barriers to m-banking adoption can be broadly divided into two categories; customer perspective cognitive barriers and supply side barriers that consist of bank, MTO and mobile device limitations (Chemingui 2013, Cruz, Laukkanen & Muñoz 2011, Laukkanen & Cruz 2012, Laukkanen 2008, Laukkanen & Kiviniemi 2010) (see Figure 3.3 for more details).

Customer perspective barriers include functional barriers of m-banking and the psychological barriers of the customers (Chemingui 2013). Barriers such as incompatibility with the work or habit of the customers, longer payment processing time, the lower visibility and display-ability of m-banking are some customer perspective barriers identified in previous m-banking research (Chemingui 2013, Laukkanen & Lauronen 2005). Customers' perception on m-banking values, such as unsuitability to effectively meet the banking requirements or failure to meet performance-to-price also hinders customers in adopting the service (Luo, et al. 2012, Kuisma, Laukkanen & Hiltunen 2007). Apart from these cognitive barriers, research studies also reported customers' perceptions on risk barriers such as financial risk, economical loss and security risks. (Laukkanen et al. 2007, Cruz, Laukkanen & Munoz 2011).

Apart from customer perspective barriers, there are supply side barriers too in m-banking adoption. The supply side barriers consist of banks', MTOs' and mobile device limitations (Scornavacca & Hoehle 2006, Laukkanen & Kiviniemi 2010, Lee, Mattila & Shim 2007, Luo et al. 2012). The limitations of mobile networks and mobile devices are two supply-side barriers identified in m-banking research. Slow network, poorly performing user interface and high price of SMS make the service unattractive to the user and fail to meet performance-to-price. Previous research explores that supply side barriers such as lack of banking information and incomplete product range make the service unsuitable, especially for the unbanked (Laukkanen & Kiviniemi 2010). Despite the fact that it is important to identify the source of barriers, research on m-banking

adoption barriers has received inadequate attention, especially in Bangladesh. Therefore, research should explore the barriers to develop strategies to reduce the barriers (Laukkanen & Kiviniemi 2010). However, the resistance study has a managerial implication too; it identifies the favourable customer segments and the prospective adopters of m-banking.

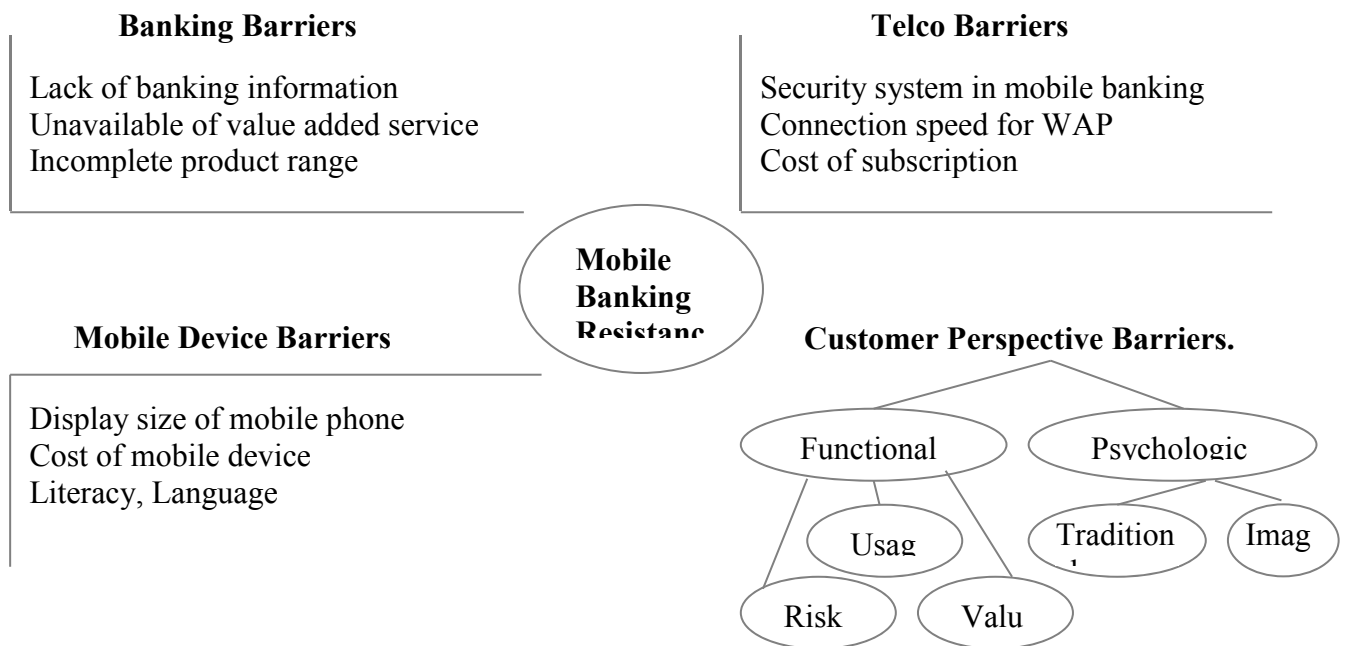


Figure 3.3: M-banking barriers and concerns.

Therefore, m-banking service providers in Bangladesh must understand the barriers of rural SME owners/managers that might prevent them from adopting the service. Most of the SME owners/managers are new mobile phone users. Moreover, some of the SME owners/managers in rural Bangladesh are new to the banking system and they have lower literacy levels. The above discussion bring us to the following question:

4. What are the barriers in implementing m-banking for the rural SMEs in Bangladesh?

3.9 Knowledge sharing and recommendations of the stakeholders

M-banking is an innovation and a new service in Bangladesh. Thus knowledge sharing and communication between the stakeholders have been essential in m-banking. Moreover, m-banking is a service incorporating a wide range of different organisations. Therefore, the recommendations of the participating stakeholders are important in the implementation of the service. Furthermore, knowledge sharing is important to understand deeply the human, social and macro-level perspectives of m-banking. It is important to note that social practice and contextual norms greatly influence the money management and banking of the customers (Medhi, Ratan & Toyama 2009). Most successful m-banking systems such as M-PESA in Kenya occurred in collaboration with a research institute like FinMark Trust (Jenkins 2008).

However, only a handful of studies in Bangladesh has investigated the recommendations of the banks, MTOs and policy makers. It is therefore important in Bangladesh to investigate actual banking needs of the SMEs from banks, MTOs, SME research institutes and government, and recommend the findings to the m-banking implementers. This research thus seeks to investigate:

- 5. What are the stakeholders' recommendations in m-banking adoption for rural SMEs in Bangladesh?***

Chapter 4

Research design and research methodology

The chapter describes the research design, research methodology and data collection strategies of this research. The chapter commences by restating the research questions. The discussions then proceed to the philosophical view of the research. The research applies a mixed method approach and a section justifies the suitability of mixed methodology to this study. The methods are both quantitative (a survey of SMEs owners and managers in 4 rural villages in Bangladesh) and qualitative (interviews and a focus group). Lastly, a section covers the University of Technology, Sydney ethical requirements and how this research has addressed these.

4.1 Introduction

Research is a systematic investigation or inquiry of a research phenomenon. Research can be described as a series of rational decision making processes where data are collected, analysed and interpreted to provide the scientific explanations of research objectives (Mackenzie & Knipe 2006). Research is a journey to knowledge and a proper research design with appropriate research methodology can ensure the realization of the research objectives (Kothari 2004). Thus research design, research methodology and data collection strategies were essential considerations in this study.

4.2 Restatement of the research questions

The purpose of the research is to develop an m-banking framework for rural SMEs in Bangladesh. SMEs play an important role in the Bangladeshi economy (Ahmed & Chowdhury 2009, Minto 2006, Uddin 2006). However, access to finance is one of the main obstacles to the growth of SMEs in Bangladesh (Alam & Ullah 2006, Moazzem 2008, Nichter & Goldmark 2009). The increasing popularity and the high diffusion rate of mobile phones in Bangladesh provide the banks with an opportunity to offer m-banking to the SMEs which have limited or no banking opportunities, particularly the rural SMEs.

In order to develop this m-banking framework for the rural SMEs in Bangladesh, answers to the following research questions are required, as established in the literature review:

1. What benefits can be achieved for the rural SMEs, banks, telecommunication organisations and the government by offering m-banking to the rural SMEs in Bangladesh?
2. What are the customer perspective factors which influence the intention of rural SMEs to adopt m-banking in Bangladesh?
3. What are the country-level and organizational factors that impact on implementing m-banking for rural SMEs in Bangladesh?
4. What are the barriers in implementing m-banking for the rural SMEs in Bangladesh?
5. What are the stakeholders' recommendations in m-banking adoption for rural SMEs in Bangladesh?

4.3 Research design

Research design consists of the plans and strategies of a research study. A proper research

h design ensures that the collected data can answer the research questions as unambiguously as possible (Yin 2011). In other words, the research design aims are that the essential data can be gathered and analysed to arrive at a solution. However, research design deals with the logical problem not the logistical problems (Yin 2011). In this study the research design was based on the researcher's decisions, such as the purpose of the study (exploratory and descriptive), the context of the study (i.e., the study setting in Bangladesh), the type of study (mixed methods) and lastly analysis of the collected data.

Creswell (2003) identifies research design as the intersection of three elements, the philosophical view of the researcher, the research methodology and strategies of inquiry. Following Creswell (2003), this research adopts the research design as below (Figure 4.1):

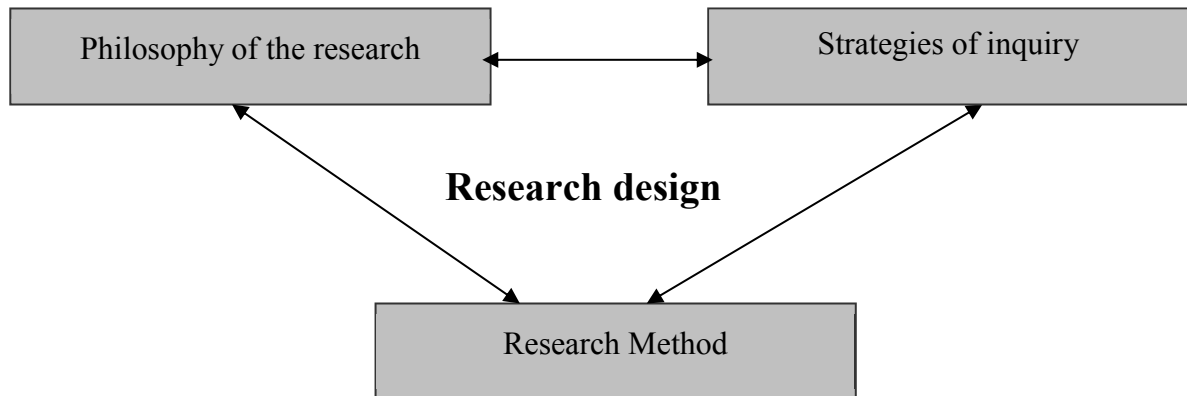


Figure 4.1: Research Design Framework (Creswell 2003)

4.4 The Philosophical idea of the research

The philosophical view is the perceptions and beliefs of a researcher that leads him/her to undertake the research. The philosophical view of the research has been defined by different researchers. Lincoln and Guba (2000) and Mertens (1998) described research philosophy as paradigms. Guba (1990) saw research philosophy as the basic set of beliefs that guide research action. Creswell (2009) defined research philosophy as the researcher's worldview that is a general orientation about the world and the researcher's idea of the research.

The philosophical idea of the researcher is largely hidden in the research (Creswell 2003). This is because, the philosophy reflects the researcher's ontological, epistemological and methodological assumptions (Guba & Lincoln 1994). Ontology represents the researchers' assumptions concerning reality, epistemology is knowledge of the reality, and methodology is the particular ways of knowing the reality (Sale, Lohfeld, & Brazil 2002). It is thus considered appropriate that the researcher acknowledges the philosophical and epistemological perspectives as this will affect directly the research study.

The major paradigms in Information Technology research are positivism, post-positivism, constructivism and pragmatism. Positivist research is premised on the existence of prior relationships and investigates with structured instruments (Orlikowski & Baroudi, 1991). According to Phillips and Burbules (2000), the post-positivist research paradigm tests, verifies or refines the claim and if necessary it reduces the ideas into a small and discrete set of knowledge that is scientifically proven (Creswell 2009). Interpretive research aims to understand how members of a social group constitute their social actions through the social process. The critical philosophy research attempts to critically evaluate and transform the social reality under investigations (Orlikowski & Baroudi, 1991).

In terms of the elements of research philosophy, this research is placed within the pragmatism paradigm. Pragmatism philosophical idea is problem-centric and emerges from a real world practice. Pragmatism is not committed to any particular research approach and is based on empirical data, evidence and rational considerations. Researchers take a pluralistic approach and have the freedom to select from a range of research approaches. Commonly pragmatism is the philosophical partner of mixed method research (Johnson & Onwuegbuzie 2004). However, a belief on real world problems may take the research away from the theoretical premises (Cresswell 2009).

4.5 Research Methodology

Research involves undertaking which seeks answers or explanations to research questions and a proper research methodology can ensure the explanations are scientifically acceptable. The research methodology is the approach the researcher adopts that is capable of providing valid answers to the research questions (Kumar, 1996). After the philosophical consideration of the research, it becomes essential for the researcher to consider the most appropriate research methodology for his/her study. However, the research methodological consideration should be based on the nature of the research phenomenon first, and then it should answer the question of which method can adequately interrogate the research problem (Leedy & Ormrod 2000).

Qualitative and quantitative are two broad methodologies used in this research. Quantitative research methodology describes research using numerical representation, statistics and precise statements (Neuman 2003). On the other hand the qualitative study describes a phenomenon using description, interpretation, verification and evaluation (Peshkin 1993). Qualitative research emphasizes the processes and meanings that cannot be rigorously examined or measured.

Quantitative and qualitative research methodologies refer to different data collection methods, analysis and reporting modes. Furthermore, qualitative and quantitative research both belongs to distinctively different paradigms (Brannen, 1992). The quantitative research paradigm is based on positivism (Sale, Lohfeld, & Brazil 2002). In contrast the qualitative paradigm is based on interpretivism and constructivism (Sale, Lohfeld, & Brazil 2002). Ontologically the quantitative paradigm believes in one truth but qualitative paradigms accept multiple truths or multiple realities. Epistemologically they differ from each other too. In quantitative research the researcher and the participant are independent entities. Guba and Lincoln (1994) suggest in quantitative research, inquiry takes place as through a one way mirror. The researcher studies the phenomenon without influencing it or being influenced by it. But in qualitative research the researcher and the participants interact with each other and the findings are created within the context. Another difference between these two approaches is in data collection techniques. In quantitative research the data collection is controlled by a systematic procedure. The sampling, the use of statistical methods and highly structured protocols in quantitative research ensures a scientific analysis. In contrast qualitative research employs techniques such as an interview, case study, ethnographic study etc. The number of participants is comparatively smaller and emphases are given on the process and meaning.

Though the quantitative and qualitative research may differ in many ways, they complement each other too. Both approaches systematically collect data and carefully explain the research questions. In the words of Haase and Myers (1988), both approaches share the goal to understand the world (Sale, Lohfeld, & Brazil 2002). Regardless of the paradigmatic orientation, both sets of research use data validity to

maximize the data reliability. Thus a combination of both methodologies can provide a richer and more reliable result to the complex phenomenon, such as the information system research (Johnson & Onwuegbuzie 2004, Mingers 2001).

4.5.1 Mixed method research

Mixed method research is the third research movement that moves past the quantitative and qualitative debate (Johnson & Onwuegbuzie 2004, Johnson, Onwuegbuzie & Turner 2007, Venkatesh, Brown & Bala 2013). The method has gained significant popularity among education, social science and human science research, and recently in Information Systems research. This is because, in social and human science research, sometimes using one single approach of methods is not enough to answer the complex research problems. A mixed methodology, on the other hand, can provide useful insights into research by more detailed and expanded answers.

By utilizing quantitative and qualitative techniques within the same framework, mixed methods research incorporates the strengths of both methodologies (Johnson & Onwuegbuzie 2004). Another implication of the method is the biases inherent in any single method are neutralized by the other method (Sechrest & Sidana 1995). In this method data collected from a single approach can be supported by other data collected in a different approach. This builds a more detailed result that has less bias.

This research adopts a mixed method approach as the research studies the complex and interrelated phenomena of m-banking adoption in rural area SMEs in Bangladesh. M-banking itself involves the interrelated disciplines of technology, systems and social perspectives (Dahlberg et al. 2008, Duncombe & Boateng 2009). Previous m-banking research studies are criticized for being too technology-led or too customer focused. Thus the use of the mixed method approach becomes essential to include all possible perspectives from technological, contextual and social perspectives. Furthermore, SMEs are organisations with owner/employees, business environment, and technology adoption. Similarly, the m-banking provider, the banks have several complex dimensions that impact upon m-banking adoption. Thus there are a myriad of properties associated with m-banking adoption for rural SMEs in Bangladesh which makes mixed methods appropriate.

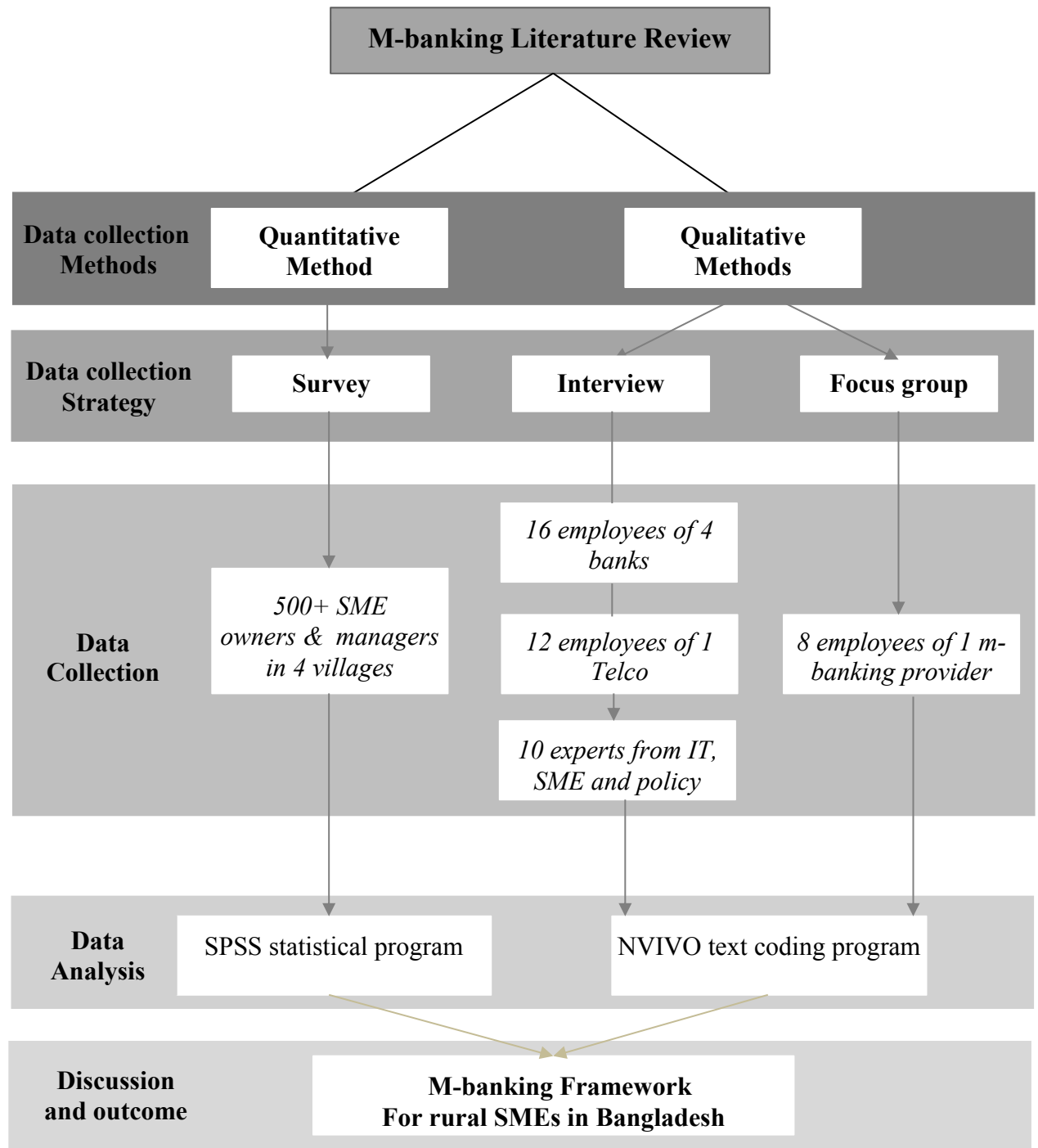


Figure 4.2: Research Methodology

4.5.2 Strategies of inquiry

A variety of data collection strategies such as: survey, interview and focus group were employed in this research. Two phases of the research can be distinguished, the first phase was surveying of SMEs operating in four villages and the second phase was interview, focus group and observation of m-banking air time agent. In this research survey provides a numeric description of cognitive factors of SME owner/managers and the interviews with bank officers, MTO officers and m-banking policy-makers provided macro-level factors associated with m-banking.

This section provides detailed descriptions of the data collection strategies adopted in this research.

4.5.3 Survey procedures

The survey is one of the most dominant strategies of inquiry associated with quantitative research (Neuman 2003). The survey provides a numeric description of a population by studying a sample of that population and researchers explain based on the data received within that sample (Cresswell 2009, Pinsonneault & Kraemer 1993). Survey research captures the fleeting moment at the time (Leedy & Ormrod 2000).

To understand the banking needs, usage of the mobile phone, attitudes, concerns regarding m-banking of the rural SMEs owners/managers, in this research a survey was administered to rural SMEs in Bangladesh. The research surveyed around five hundreds (500) SME owners and managers in four rural villages in Bangladesh.

4.5.3.1 Selection of villages and survey participants

The survey was conducted in four villages in the Ganbandha district of the Rajshahi division of Bangladesh. The villages provide a microcosm of rural Bangladesh. Like other villages, agriculture provides the main source of livelihood. SMEs provide the second source of income (Davis et al. 2010). But in the non-harvest season and in the

time of drought or flood when agriculture is not possible, SMEs are the only option of livelihood in these villages. Like the country as a whole, the villages are predominantly Muslim with a Hindu minority (Schendel 2009). The villages are not close to any big cities, approximately 20-30 kilometres from the district headquarter. So the urban influence has little effect on the villages. The district is considered among the poorest in Bangladesh (Mottaleb & Tetsushi 2013) and therefore provides an excellent target for research which aims to assist development. Though there are several government bank branches, private banks (PCB) do not consider these villages viable for business as PCBs are heavily skewed in favour of wealthy and urban centres. Till to date no commercial bank has opened a branch in any of these villages. But in Bangladesh, PCBs have gained significant success in poverty alleviation and economic development. Bangladesh Bank also disburses loan through PCBs. These are the reasons for selecting these particular villages.

4.5.3.2 The population, sample and participants

The intended population for this study was the body of SMEs within the rural villages of Bangladesh. The rural SMEs are defined in this research as SMEs that operate outside of the metropolitan area, municipality and a district. The survey includes a wide variety of SMEs, from grocery shops, agricultural business, health service, fashion and garments, restaurants, tea stall, riskaw puller, real estate related business etc.

This research was set in the rural villages for number of reasons, such as,

- Rural SMEs contribute greatly to the Bangladeshi economy.
- Rural SMEs are deprived of effective banking system in Bangladesh.
- It is expected that rural SMEs will be more likely to be benefited from the adoption of m-banking.

SME owners/managers who had a mobile phone or had an intention to buy a mobile phone were included in the survey. The research undertook a purposeful selection of SME owners/managers that provided a balanced and representative sample. SMEs were heterogeneous in terms of type and size. Some participants had a bank account while

the rest were from the cash economy. Some were educated (atleast a formal educational qualifications upto secondary school), some semi-educated (did not have formal education but could read and write) and some uneducated. Both male and female participants were included. The research surveyed 550 SMEs owners and managers. The large sample size makes the result strong and significant.

4.5.3.3 Justification of quantitative research and participant number

There is a growing concern that m-banking implementation should be founded on empirical research and that data should be collected from larger numbers of participants than has occurred to date (Bångens & Söderberg 2008, Dahlberg et al. 2008, Duncombe & Boateng 2009, Porteous 2006, Weber & Darbellay 2010). Donner (2008) also suggested in-depth studies analyzing primary data. Another researcher argued to collect data from a wider population to make clarity and reliability (Duncombe & Boateng 2009). Lastly, Duncombe and Boateng (2009) make a strong case that the greater participants in the m-banking research will strengthen the understanding of the banking needs of the customers.

4.5.3.4 Developing and Pre-testing the questionnaire

This research used a survey which was administered to SMEs within rural villages in Bangladesh. The researcher prepared an initial survey questionnaire based on the hypotheses. The survey questionnaire was then pre-tested by a group of IT professionals, bank officers and Telco officials. The participants were given the questionnaire in both English and Bangla. The pre-testing helped the researcher to gauge the clarity of questions, to understand whether the instrument was capturing the desired phenomena and to verify if any important variable was not being omitted. Feedback served as a basis for correcting, refining and enhancing the survey questionnaire.

The responses helped in reshaping the questionnaires. Changes were made and several iterations were conducted. 4 items required re-wording as the questions appeared

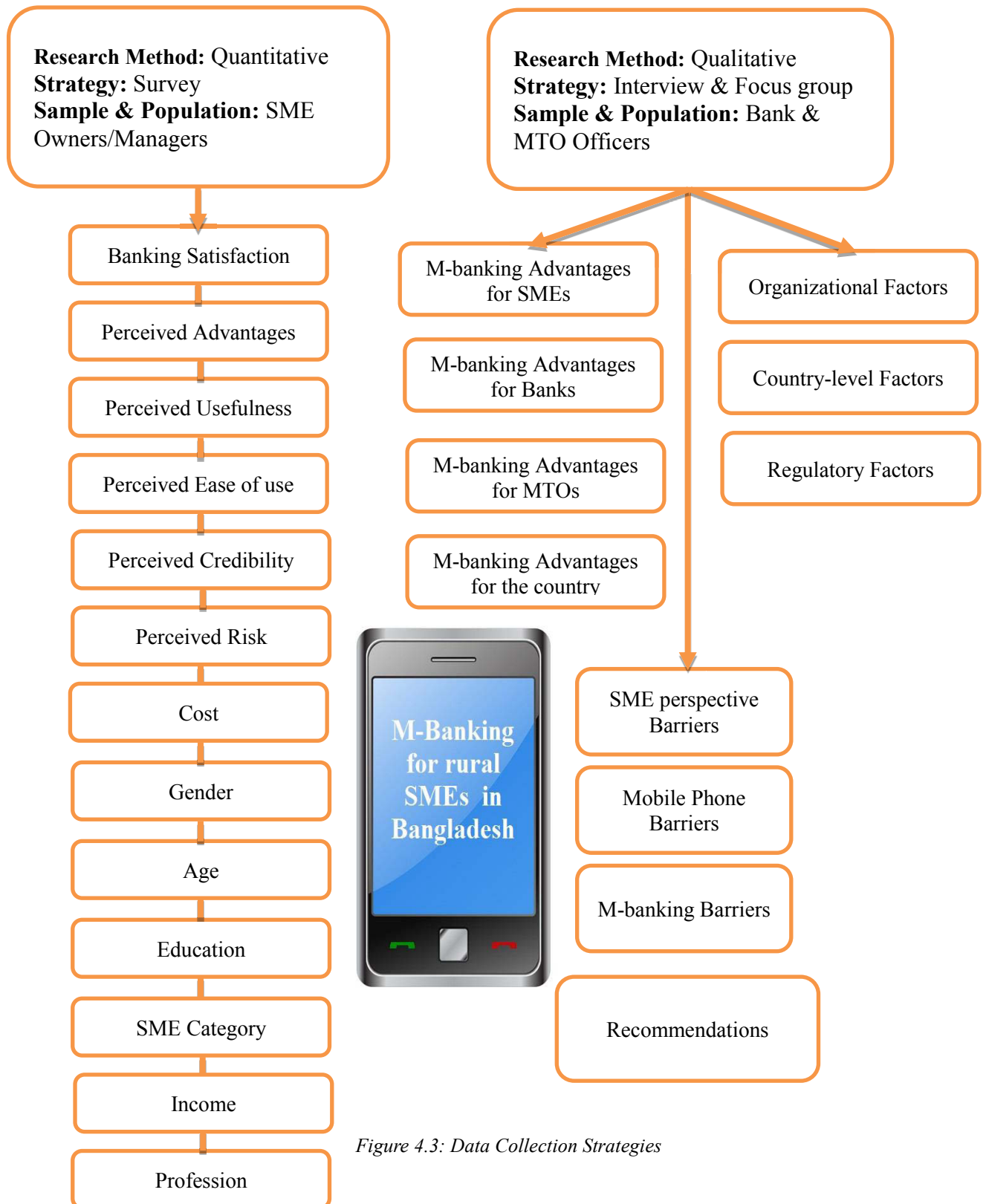


Figure 4.3: Data Collection Strategies

ambiguous. Several open ended questions were converted into closed ended questions, as participants informed that open ended questions might be difficult for the actual survey participants. Some other examples of the changes were, use of local dialect instead of formal *Bangla* language, use of the more common terms instead of technical words.

4.5.3.5 The pilot study

A pilot survey was conducted on in August 2011 in the business union office of a village namely Lakxipur to test the survey instrument in terms of its wording, the sequence of questions and the layout of the questions. It also allowed the researcher to gain familiarity with the participants. In this research 28 participants (19 males and 9 females) were invited to do the pilot study. They were given the questionnaires in Bangla; 18 participants returned them without any problem, which represents a rate of 71%. The respondents identified problems with the wording of the questionnaire, which resulted in further changes, as well as the participants' unfamiliarity with the Likert-scale system.

In this study, a pilot survey was conducted on 25th August 2011 in the business union office of a village namely Lakxipur to detect the weakness of the survey instrument. The pilot study is always advisable as it can test the wording of the survey, the sequence of the questions and test the layout of the questioners. It also allows the researcher to gain familiarity with the participants. Copper and Schindler (1998) suggest 25 to 100 subjects are suitable for a pilot study. In this research 28 respondents were invited to do the pilot study. The participants were from the population and a mixture of educated and uneducated SME owners and managers. The participants were informed about the research and explained the purpose of the pilot study. They were given the questionnaires in Bangla, 18 returned without any problem. This was 71% good respondent rate. However, the respondents, those had problem were asked to explore the problems they encountered in the survey. The identified problems were wording of the questionnaire and the participants unfamiliarity with the likert-scale system.

4.5.3.6 Survey instrument

The final survey was in the native language and had four sections: current banking status, mobile phone usage, the perception of m-banking factors and the demographic questions. Participants had to tick the appropriate answer/s for three sections (banking, mobile phone and demographic), but the participants' perceptions of m-banking factors were collected using a five-point Likert-type scale. The demographic questions for this research were placed at the end as it was considered better to keep participants' minds on the purpose of the survey at the beginning. There was no technical jargon or difficult words in the questions, and closed ended questions were used. This helped the respondents to make their decision quickly when answering. In each question, a space was given in case the participant had something to add in their own word.

4.5.3.7 Items and variables

In survey, the variables and items are the main focus of the questionnaire (Neuman 2003). The dependent variable is the intention to adopt m-banking. Traditionally intention is measured using a Likert scale, but the intention can also be measured dichotomously (Ajzen & Fishbein 1969). In this research the dependent variable has three possible outcomes: intention, indecisive and no-intention. The intention category has expressed to use m-banking service as soon as the service becomes available to them and the no-intention category has no intention to use the service at the moment.

The items are selected based on purpose to identify the banking and banking need, mobile phone usage and requirements of SMEs in m-banking. The items and variables are derived from existing m-banking literatures. For instance, perceived ease of usage of m-banking is measured using the items adapted from the original TAM (Davis, 1989). The items and variables are also refined by a pilot study and are rephrased to suit the context of the study.

This research is established on the premises of IDT, TPB, TAM, and the m-banking framework by Luarn and Lin (2005). The thesis considers the factors reported in several related works, such as factors of perceived usefulness, perceived ease of use, perceived credibility, perceived risk, cost and demographics. However, the research also

contributes to the body of knowledge by introducing three new factors which impact on the intention to adopt m-banking, namely banking satisfaction, m-banking advantages for SMEs, and SME business type. These factors are rarely mentioned in prior studies. The factors which were considered in this study and the hypotheses which relate to them are listed as follows and summarized in table 4.1:

Table 4.1: Variables and items Included in the survey

Factors		Study
Banking	Banking satisfaction	(Brown et al. 2003)
Mobile Banking	M-Banking advantages for rural SMEs	(Chu & Yaobin 2009) (Hong et al. 2008) (Kim, Shin & Lee 2009) (Zhou, Lu & Wang 2007)
	Perceived usefulness	(Barati & Mohammadi 2009 (Kleijnen et al. 2004) (Luarn & Lin 2005) (Tobbin 2009) (Wang, Lin & Luarn 2006)
	Perceived ease of use	(Barati & Mohammadi 2009) (Chu & Yaobin 2009) (Kleijnen et al. 2004) (Luarn & Lin 2005)
	Perceived credibility	(Luarn & Lin (2005) , (Wang, Lin & Luarn 2006)
	Risk	(Anus et al. 2011)(Brown et al. 2003) Luo et al. 2010
	Cost	(Kleijnen et al. 2004) (Luarn & Lin (2005) Wang, Lin & Luarn 2006 Luo et al. 2010
SME characteri	SME category	
User characteristics	Gender Age Education Income	(Anus et al. 2011) (Barati & Mohammadi 2009) (Chu & Yaobin 2009) (Wessels & Drennan 2010) (Kleijnen et al. 2004) (Luo et al. 2010)

There was no technical jargon or difficult words in the questions, and closed ended questions were used throughout the whole questionnaire. This was quite helpful as respondents could make a quick decision when answering (Cavana et al. 2001), and it provided greater uniformity, thereby making data processing easier (Babbie, 1990).

4.5.3.8 Measurement

A five-point Likert scale, with anchors ranging from “strongly disagree” to “strongly agree”, was used for all questions except the demographic ones. For instance, “1” denoted as strongly disagreed, “2” denoted as disagree, “3” denoted as neutral, “4” denoted as agree and “5” denoted as strongly agree.

4.5.3.9 The survey process

The SME owners and managers for the survey were contacted thorough the local business union. The researcher notified the business union about the survey date, time and details of the survey. The business union informed the local SMEs about the survey. SME managers and owners were informed that they had to spend 1 hour to answer the questionnaire.

The survey was conducted in two phases. In the first phase, the educated SMEs who had shown strong interest in the research and had a previous understanding of surveys were identified. The researcher gathered 5-10 participants and briefed them about the procedures. This gave an opportunity for any questions from the participants to be answered to establish clarity. In the second phase, the participants comprised the uneducated/semi-educated or less enthusiastic SME owners/managers, and female entrepreneurs. The researcher visited their shops and workplaces and administered the survey. The shortage of time, unawareness of the research process, personal issues and illiteracy were identified as some reasons that inhibited them to participate in the survey in the first phase. In the situation where the participants had no reading and writing ability, the researcher asked the questions orally and recorded the answers.

4.6 Qualitative Research

The qualitative methodology in this research is based on an interpretive approach in the qualitative research tradition. The interpretive approach advocates the development of understanding of human behaviour by considering surrounding contexts. It is therefore a suitable framework when there is a need for explorative research to understand complex

human behaviour. In this research the focus is on the participants' perceptions, attitudes and experiences towards development. Previous studies have not adequately addressed these aspects of m-banking in the social context of rural areas, especially in Bangladesh.

Qualitative research produces findings about peoples' lives, experiences, behaviours, emotions and feelings as well as organizational functions, social movements and cultural phenomena (Strauss & Corbin 1998). Studies that attempt to depict the experiences of a divorced person, the pain of having a chronic illness or addiction have natural requirements for qualitative research (Strauss & Corbin 1998, Kaplan & Maxwell, 1994). In qualitative research the findings are not arrived by statistical procedures or other means of quantification. The usage of qualitative research methods is increasing in computing studies and in the Information Technology discipline (Kaplan & Maxwell, 1994). Qualitative data are gathered from interview, observations and open-ended questions. The researcher is neutral and the study involves a systematic and detailed study in a natural setting. The researcher himself is the best data collection instrument.

The study employed two (2) data collection strategies in the qualitative research, firstly, one to one interviews with the bank officers from the private banks, officers from a mobile telecommunication provider and the expert representatives consists of university teachers, ICT researchers and ICT practitioners. Secondly a focus group with a bank that implemented m-banking. The qualitative research took place during August 2011.

4.6.1 Interview

The interviews in qualitative research are considered an important tool when a researcher wants to know where, when, how and under what circumstances. Interviewing provides the opportunity for the researcher to obtain in depth information. Leedy & Ormrod (2000) suggest the interview is more appropriate for complex situations and the areas where little information are discovered.

There are several reasons to interview the bank officials. The primary reason was to understand their views and perceptions in m-banking. To reveal the benefits and the adoption possibility of m-banking were other important issues. As expected, bank

officers revealed information about the banking policy, IT infrastructure of the bank, and future plans regarding m-banking. Telecommunication officers' elucidated information about the mobile infrastructure of Bangladesh. However, Information Technology of banks in Bangladesh is an uncovered area and very little research was conducted on the approach to IT of banks. However, m-banking is related with information technology; so some questions on IT were also asked to the bank officers to understand IT maturity.

4.6.1.1 Selecting banks, telcos and expert representatives

In qualitative research, the researcher purposefully selects participants whose insights, experiences and thoughts are valuable for the research (Cresswell 2009, Neuman 2003). As suggested, this research adopts a purposeful selection of officers from banks and Telcos. The research includes SME focused bank and which had an intention to adopt m-banking. The reasons are, firstly, the SMEs banks were a good source of SME related knowledge, such as rural SMEs banking, banking needs and the factors related to m-banking and secondly the bank's having m-banking experiences can provide information on m-banking infrastructure, recent developments and m-banking factors etc. The researcher selected the banks by studying their m-banking status. All banks websites were visited during June and July 2011 to identify banks that have strong emphasized on m-banking.

The selection of mobile telecommunication provider was comparatively easy. The selection criterion was mobile commerce initiatives of the Telco. The research included Telco that has a strong interest in mobile commerce. It is expected that telcos adopting m-commerce have related experience that will benefit this research. The Telco officers can provide information on rural customers' mobile usage, m-banking infrastructure and m-banking factors

Table 4.2: Details of interviewees

Code	Designation and Department	Experience
Bank Officials		
BM1	Executive Vice President and Manager	30+
BM2	Senior Vice President and Manager	30+
BM3	Vice President and Head of Branch	25+
BE1	Assistant Vice President, Card Operation division	25+
BE2	Assistant Vice President, Manager Operation	22+
BE3	Executive, Loan Disbursement	15+
BE4	Junior Executive, Product Development and marketing	8+
BO1	Senior Principal Officer, Credit analyst	18+
BO2	Principal Officer, Credit analyst	12+
BO3	Teller	9+
BS1	SME Manager of a bank	22+
BS2	SME loan officer of a bank	18+
BS3	SME customer service	7+
BIT1	Vice President and Head of ICT	25+
BIT2	Senior Officer, ICT	18+
BIT3	Officer, ICT and Communication	12+
Mobile Telecom Officials		
MT1	General Manager, ICT and System Operation	22+
MT2	General Manager, Network and Vas	20+
MT3	Deputy General Manager, Sales and Distribution	20+
MT4	Deputy General Manager, Humane Resource	16+
ME1	Corporate Manager, Marketing Department	15+
ME2	Deputy Manager, Server Operation	15+
ME3	Deputy Manager, System Operation	16+
ME4	Assistant Manager, IT and Billing, VAS	14+
ME5	Executive, Operation	15+
ME6	Assistant Manager, System Operation	12+
ME7	Assistant Manager, Intelligent Network, System Operation	10+
ME8	Junior Officer, Corporate and Event management	9+
Expert Representative (University Teacher, IT researcher, SME expert, ICT policy Maker)		
RE1	University Teacher and IT Researcher	30+
RE2	University Teacher and IT Researcher	35+
RE3	Social researcher of NGO Expert	15+
SME1	University teacher and SME Expert	25+
SME2	SME researcher of NGO Expert	12+
SME3	SME researcher of NGO Expert	10+
ITP1	Mobile Technology Content Developer and Policy Researcher	22+
ITP2	IT Policy Researcher	17+

ITP3	Programmer and IT researcher	15+
ITP4	ICT Developer and Policy Researcher	11+

The expert representatives were comprised of m-banking policy makers in Bangladesh, mobile commerce content developers, IT professionals and university teachers those are engaged in policy formation in Bangladesh. Besides the researcher's own contacts, the high officials of banks and telcos helped the researcher to identify the potential experts of m-banking.

4.6.1.2 Gaining access to the organizations

The selected organizations were approached directly by the researcher. The researcher submitted a request letter with the research background and a list of frequently asked questions (FAQ) to the human resource of the banks, telcos, research organizations and NGOs. The researcher maintained a regular contact with the organization's human resource division to keep track of the progress of the research request. In some cases, the management wanted a presentation by the researcher before approving the research request. However, most of the targeted organizations positively agreed to participate in research. Some organizations selected the interviewees themselves and some organizations allowed the research to select the participants. In this case, the participants were selected jointly by the human resource and the researcher. However, the selection criteria were simple; the person who had an understanding with the m-banking, the person who works in banks or Telco IT sector and the person who works closely with small medium enterprise, were selected

In total 16 Bank officers, 12 Telco officers and 10 representatives for the expert representatives were included in the research. The numbers of participants compare very favourable with existing studies, most of which are based on limited participation. The numbers were chosen not only because it will give enough information for the research but also the numbers were physically possible to interview. The researcher considered high management, mid-level management and the junior level officers. The purpose of interviewing senior managers and mid-level management was to understand

the future directions of the organization regarding m-banking and to understand m-banking operations (if any). In Bangladesh junior officer jobs are more customer oriented and therefore junior level managers will also be included in order to collect information regarding SME owners, managers and m-banking customers.

4.6.1.3 Interview instrument

Interview in qualitative research can be structured, semi-structured and un-structured. A structured interview employs a prepared set of questions that are asked to the interviewee. A criticism of this kind of data collection is that it is more quantitative/survey in nature and it can limit the discussion that erases the qualitative nature of the research. Unstructured interview does not have any detailed questions and could be carried away from the main research topic. Therefore, this research employed semi-structured interview and had open ended questions in order to guide the discussion without being limiting. In the interview the participants were asked pre-determined questions using the same wording and order of questions as specified in the interview schedule. The open ended questions allowed the bank, Telco and expert representatives to express themselves openly with their opinions and in their own words. Usefulness is the open-ended question does not have any prescribed answer and can become more exploratory. However, after the answer received closed questions was asked to make his position and response more accurate, as suggested by Yin (2011).

The literature review was the foundation of the semi-structured questions in this research. Three (03) sets of questions were developed, one for the bank, one for the Telco and one for the expert representatives. Neuman (2003) says researchers ask three kinds of questions in the interview; such as descriptive, structural and the contrast question. Descriptive questions such as SMEs banking information, the mobile phone usage pattern, and the advantages of m-banking for SMEs etc. were included. Structural questions such as m-banking infrastructure with the organization, m-banking initiatives and the possibilities of m-banking were asked. Contrast questions such as m-banking compared to western union and money union etc., required legislations compared to the current one were also included.

Typically the interview lasted for 40-50 minutes and the recording were done in a Sony voice recorder. After each interview the audio file was transferred in computer to maintain safety and security. After the transfer the audio recorder was formatted and made ready for the next interview.

4.6.1.4 Interview process

For each of the participants an interview appointment was made after the approval of the organizations and after the participants' agreement. The participants themselves selected the interview venues. These were typically the interviewee's office, lounge area or local tea stall. However, as suggested by Neuman (2003) the interview venues were carefully selected where privacy was afforded and where the interviewee was not pre-occupied. Female participants mainly preferred their own premises to take the interview. Only 4 participants preferred the restaurant or local tea stall.

Participants were briefed about the research before starting the interview. He/she was given the background information about the research. A consent form that highlighted the research policy, interview recording procedures, privacy of the participants and complaints was provided. He/she was asked to read the consent form and encouraged to ask any question if he/she had any doubt.

Once the participants accepted to take part in the research and expressed their understanding, they were asked to sign the consent form. Then the actual interview started. Neuman (2000) advices to spend some times with the participants before the interview start. This is particularly true in Bangladesh where social conversation and interaction helps to build a rapport. These informal conversations make the participants easy and more understandable to the research. The interview was recorded; the researcher also noted any details such as body language, facial expression or concern that could be recorded on the voice recording. At the end of the interview the participants were informed that they can contact the researcher, the research supervisor or the UTS HREC. They were given the contact details.

4.6.2 Focus group

This research employed an exploratory approach using a focus group. A focus group is advisable when existing knowledge of a subject is unfamiliar, inadequate and research is conducted under limited theoretical supports (Powel & Single, 1996). The focus group employed in this research was from a private bank. That bank is an SME focused bank and was an early adopter of m-banking in Bangladesh.

4.6.2.1 Selecting the bank and gaining access to the bank

In this research, all Bangladeshi banks' websites were checked to identify the banks that have a strong emphasis on SMEs and m-banking. After the identification, the researcher approached several banks for access, however only one bank agreed to participate in the research. Before agreeing, the bank's management wanted a presentation on the research. After the presentation, the bank positively agreed to participate in the research. Being an SME-oriented bank, it was a good source of SME related knowledge, such as SMEs' business, SME/banking relation and SMEs' banking needs. Moreover, being am-banking implementer, the bank had practical knowledge on m-banking advantages for SMEs, organisational and country-level factors and the obstacles in m-banking.

4.6.2.2 Selecting the members of the focus group

The focus group participants were selected based on their insights, experiences and thoughts, which are valuable for the research (Yin 2011). The bank management first nominated the members and then the researcher finalized the selection of representatives based on their experiences and work expertise. At last in total 8 officers were included in the focus group. The number was chosen not only because they would give enough information for the research but also the numbers were enjoyable to run and manage the focus group. Moreover, setting them up was not bedevilled by any logistic problem. Table 4.3 summarizes the focus group participants' details.

Table 4.3: Focus group participants' expertise

Participant's Code	Department and designation	Job responsibility	Experience
Participant 1	Head of IT and m-banking	Leading the IT/m-banking department, stakeholder management, software/hardware management, and policy development.	20+ years
Participant 2	Head of m-money and m-salary	Manage m-salary and m-money section, participate in policy and regulatory development.	20+ years
Participant 3	SME banking (Loan manager)	Approve, disburse and manage SME loan, manage SME account, participate in policy development.	12+ years
Participant 4	SME banking (Administration)	Work with SMEs, provide training, disburse loan and manage loan, participate in policy development.	8+ years
Participant 5	Technical / IT Implementation	Manage IT and m-banking system, and communicate with the MTOs if any issues arise; participate in IT policy development.	10+ years
Participant 6	Technical / IT Implementation	Install, update and manage IT and m-banking system, and communicate with the MTOs if any issues arise.	7+ years
Participant 7	Technical / IT Implementation	Install, update and manage IT and m-banking system, and communicate with the MTOs if any issues arise.	4+ years
Participant 8	Technical / IT support	Support IT and m-banking, backup data, upgrade hardware and communicate with the customers	6+ years

4.6.2.3 Focus group discussion instrument and pre-test of questions

This research employed a semi-structured interview for its built in flexibility and ability to capture versatile array of information (Powell & Single 1996). The semi-structured interview approach guided the focus group without limiting the discussions and allowed the participants to express themselves openly in their own words. The questions did not have any prescribed answer and thus could explore the issue widely, in-fact some of the information was unexpected. However, after the answer received closed questions was asked to make his position and response more accurate (Yin 2011).

The interview instruments were tested with a small group (3 members) before the actual focus group study. The purpose was to reduce ambiguity, to see if the questions were capturing the required phenomenon and to identify questions that produce the most useful spread of information, as a way of standardizing the questions. The group was made of one SME expert and two IT experts.

4.6.2.4 Focus group discussion process

The researcher made phone calls to each of the focus group participants after the final selection of the personnel. The researcher introduced himself and briefed about the research. Yin (2011) advises to spend some times with the participants before the interview started. This is particularly true in Bangladesh where social conversation and interaction help to build a rapport. These informal conversations make the participants at ease and more aware of the research. Also the researcher answered any question of the participants to establish the clarity. When the participants were confident they were informed about the venue and the time of the discussion. The venue was carefully selected where privacy was afforded and where the participants were not pre-occupied (Yin 2011). In this case, the venue was a room in the head office of the bank's IT department.

Before the focus group started, the participants were briefed about the research. All of the members were given the background information about the research. A consent form that highlighted the research policy, interview recording procedures, privacy of the participants and complaints were provided. The participants were encouraged to read the consent form and to ask any question they had. Once all the participants expressed their understanding and accepted to take part in the focus group, they were asked to sign the consent form. Then the actual interview started.

The focus group session was two hours long. The questions prepared earlier by the researcher were used to go deeper into the discursive structures that frame the world of m-banking for the SMEs in Bangladesh. The discussions were open and uninhibited; the researcher asked a question and encouraged the participants to answer. The discussions

used a guided and instructional discussion as a means of generating rich details of the m-banking experience (Powel & Single, 1996). A focus group has different dynamics than the interview and discussion. In this research the researcher managed the dynamics of the focus group and the researcher played a non-judgmental (Powel & Single, 1996, Yin 2011) role. A focus group provides the consensus on a topic. It jogs the person's memory. However, group thinking can be a problem if participants hesitate to express their own views. There is a precaution that focus group may provide superficial information if participants do not involve in depth discussion (Powel & Single, 1996) as interaction is the central part of the focus group. The responses were audio recorded with their permission. The researcher also noted nonverbal responses such as body language and facial expressions as these can provide important aspect to research (Powel & Single 1996). At the end of the interview the participants were given the contact details of the researcher and the research supervisor in case the participants wanted to contact for any reasons.

4.7 Ethical considerations

Ethic can be defined as norms for conduct that distinguish between acceptable and unacceptable behavior (Resnik 2007). Ethic in research is important in social research and any research involving people as research has an ethical-moral dimension (Cresswell 2009, Neuman 2003, Yin 2011). Research ethics refers to the code of conduct and the norms that is expected while conducting research. Research ethics act on every step of the research, such as in the research problem specification, research questions identification, the data collection, and finally writing up the results. However, it is the researcher who is responsible to define the ethical dimensions of the research so that ethical practice is built into research.

Resnik (2007) identified several reasons to adhere to ethical norms in research. Firstly, norms promote the aims of research, such as knowledge, truth, and avoidance of error. Secondly, since research often involves a great deal of cooperation and coordination among many different people in different disciplines and institutions, ethical standards

promote the values that are essential to collaborative work, such as trust, accountability, mutual respect, and fairness. Thirdly, ethical norms help to ensure that researchers can be held accountable to the public and help to build public support for research. Finally, many of the norms of research promote a variety of other important moral and social values. Honesty, objectivity, integrity, carefulness, openness and confidentiality are some general attributes in an ethical research.

The research was conducted at UTS and UTS has ethical guidelines for research. This research followed the guidelines and obtained an ethics approval. The approval was granted on 26th July 2011, UTS HREC No. 2011-262. The ethical considerations for this research were as follows:

- The research carefully identified the purposes and the benefits that are the basis of the research. The purposes and the benefits were informed to the participants and explained in their mother language so that they could understand without any confusion. Obviously no promise or guarantee of m-banking adoption was given to the participants. A FAQ and a consent form compliant with UTS standards was given to each participant as part of the researcher's ethical responsibility. The participants were also given the contact details of UTS, the supervisors and the researcher, in case they had any questions or complaints after the data collection.
- The survey questionnaires with the SMEs were collected in hard copy and sealed in an envelope. The interviews with the bank and telecommunication officers were stored in a password protected computer. All survey questionnaires and interview data are now locked in a safe place in the researcher's home.
- To protect the confidentiality and the privacy of the participants, data collected during the interviews and the survey were de-identified using codes and the codes were stored separately. Any identification was erased and replaced with pseudonyms.
- To acknowledge the value of the input of participants, the SME survey participants were offered consultation fee of 100 Taka (Local Currency of

Bangladesh; 1BDT = AUD 0.07). This remuneration is equivalent to half a day's pay and was fixed after consultation with local people. The bank and telecommunication officers were interviewed in their normal work hours therefore did not need to be given any consultation fee.

- During the data collection, both in the interview and the survey, the researcher was concerned not to violate the self-esteem and self-respect of the participants. They were not forced in any way to participate in the research. The survey was conducted when it was suitable for the participants. In the interview, participants were asked if the interview was convenient. In case it was inconvenient, participants were re-scheduled.
- The data collected in the research was not used in any other purpose except in publication of the thesis and related conference papers and journal articles.
- Finally, the results and outcomes were not misrepresented or distorted in the thesis.

4.8 Data interpretation and analysis

The research collected both quantitative (survey) and qualitative (interviews and focus group) data. The survey data were collected in hard copy. The responses were entered into the statistical data package namely SPSS. Multinomial Logistic Regression (MLR) was used in the survey analysis to develop the m-banking framework. To assess the soundness and the effectiveness of the framework, the overall model evaluation, statistical test of individual predictors and goodness-of fit statistics was used.

The interview and focus group responses were converted into text data using MS word 2003 software. The data was then entered into the statistical data package in NVIVO for analysis. The interview and focus group data was coded using techniques from NVIVO. The purpose of coding is to classify answers to a question into meaningful categories, so as to bring out their essential patterns.

Chapter 5

Data analysis and results

This chapter analyses and presents results of the data collected in the survey, interview and focus group. Following these data results, the next chapter discusses m-banking adoption factors for rural SMEs in Bangladesh. This chapter is essential, as the factors identified in the data analysis will be used to develop the m-banking framework.

5.1 Introduction

This research applies a mixed method research methodology and data are collected using survey, focus group and one-to-one interviews. The survey data identify the customer perspective factors of m-banking that impact the rural SMEs owners/managers' intention to use the service. On the other hand, a focus group study and 38 one-to-one interviews were used to realize the critical country-level factors, organizational success factors and obstacles in m-banking adoption for rural SMEs. Thus the ultimate goal of this chapter is to identify the micro-level customer perspective factors and macro-level organisational and country-level m-banking factors.

5.2 Quantitative data (Survey of SME owners/managers) analysis and results

In the quantitative research a survey with 550 SME owners/managers was employed to collect to rural SMEs owners/managers' demographic information, banking systems, mobile phone usage, perceptions and views on m-banking factors. The quantitative data analysis and results are presented below:

5.2.1 Demographic Data

The demographic informs us about the rural SME owners/employees in Bangladesh. The demographics also contribute greatly to investigate the most appropriate m-banking

Table 5.1: Demographic data

n=550

Factors		Frequency	Percentage
Gender	Male	478	86.9
	Female	72	13.1
Age	>=18	10	01.8
	19-25	120	21.8
	26-30	149	27.1
	31-35	95	17.3
	36-40	60	10.9
	41-50	64	11.6
	51+	49	08.9
Occupation	Owner	486	88.4
	Manager or employee	64	11.0
Literacy	Completed survey by respondent	538	97.0
	Completed survey with the help of researcher	11	03.0
Education	Not completed Primary school	61	11.1
	Completed Primary	186	33.8
	Completed Secondary school certificate (SSC)	188	34.2
	Completed Higher secondary certificate (HSC)	133	24.2
	Completed Bachelor/Masters	40	07.3
Earnings in Taka*	>= 5,000	251	45.6
	5,001 to 10,000	212	38.5
	10,001 to 20,000	70	12.7
	20,001 to 40,000	14	02.5
	40,001+	1	00.2
SMEs type	Tea stall & Tobacco Shop	96	17.45
	Convenient shop & grocery	91	16.55
	Agriculture & fertilizer business	73	13.27
	Mechanical and electrical service	52	09.45
	Confectionary, bakery & sweet shops	49	08.91
	Tailors, Berber & jewellery service	48	08.73
	Tri-cycle puller and bus drivers	34	06.18
	Clothes, show and garments store	25	04.55
	Pharmacy	22	04.00
	Livestock, meat, fish and fruit shops	20	03.64
	Insurance	17	03.09
	Computer and mobile phone shop	20	03.64
	Farmers	5	00.91
Number of employees	1-5 employees	536	97.0
	6-14 employees	7	01.3
	16-50 employees	2	00.3
	Missing	6	01.0

*Note: Taka is Bangladeshi currency.

for rural SMEs in Bangladesh. For example, SME owners/managers income level would impact on the intention to use m-banking because of the cost of the service.

Gender distribution

The gender distribution indicates 86% of the survey participants were male (see Table 5.1). As the survey was conducted in the village market and the female SME owners operate business from the house, the number of female respondents in the survey was low.

Age distributions

The survey respondents had a mixture of age groups. However, among the participants, 26-30 years age group (27%) was the highest and 51+ group (9%) was the lowest (see Table 5.1). However, most SME owners/managers (2/3rds of survey participants) were in a younger age bracket (40 years or under) in rural Bangladesh.

Occupation status

The research included 486 SME owners and 64 managers/employees in the survey. In this research, the term SME owner is defined as sole owner of the SME and SME employee is defined as a person who works for an SME and receives remuneration in wages, salary, commission, tips, piece-rates or pay in kind. The reason of a higher ratio of owners in the survey is that SME are mainly operated by the owners in a rural area of Bangladesh.

Literacy rate and education statistics

Around 97% of the survey participants completed the survey by themselves (Table 5.1) and therefore 3% of the participants received help in completing the survey. The researcher helped them either to read, write or complete the survey.

The survey participants' level of education is the highest level of academic qualification of the SME owner/manager. SME owners/managers had a wide range of educational attainment, ranging from around a third who had not completed primary school who had completed bachelor/master degree. Around 34% of the survey participants had below the primary education level and 36% had gone to high school. Even 7% completed higher secondary exam and went to university level bachelor study (Table 5.1).

Income and earnings statistics

Statistics indicate that the highest number, almost half of the participants earn below 5000 Taka (Table 5.1), equivalent to 60 Australian dollars per month. However, according to the Bangladesh Bureau of Statistics (2013), Bangladesh's per capita income went up to \$848 in the 2013 fiscal year. From this statistic it can easily understand that a large number of SME owners/managers cannot afford to buy a computer and internet.

SME type, category and employee number

The participants covered a heterogeneous selection of SMEs. However, in the survey tea stalls (96), convenient shops (91) and agricultural shops (73) were dominated. (See Table 5.1). Most of the SMEs employed 1-5 employees (98%) (see Table 5.1). However, construction business and agricultural stores were found employees more than 5 (Table 5.1).

5.2.2 Participants' banking and current problems in banking

This section presents the rural SMEs banking status, banking services used by SMEs, and problems in the current formal banking system.

5.2.2.1 Banking status

The banking status (Table 5.2) reveals that 16% of the SMEs those participated in the survey were unbanked and lived on the cash economy. Furthermore, another 17% of the survey participants had no business accounts. These SMEs used the owners' personal bank for the business purposes and obviously were deprived of the benefits of having business accounts.

Table 5.2: Banking status of the SMEs

n=550

	Number	Percentage
Unbanked	115	15.4
Banked		
NGO	311	41.7
Government bank	158	21.2
The owner's personal account is used in business	87	11.7
Private bank	65	08.7
Post office	7	00.9
Other type of banking	3	00.4

When the survey participants were asked the reasons for not having the bank accounts, 23% of the survey participants considered that the SME did not need a banking. Among other reasons, bank's distance from business (18%), costly banking (18%) and unsuitable banking time for business (12%) are mentionable (see Table 5.3).

Table 5.3: Reasons for SMEs not having a bank account

n=550

Reasons	Percentage
Does not need a bank account	23.0
Bank account fee is very costly	18.7
Bank is far away	18.0
No private bank offering SME banking	14.4
Banking timetable unsuitable for the business	11.9
No bank of any kind	09.1
No business documents to open account	04.0
Other	00.9

5.2.2.2 Banking frequency

Despite the fact that more than 80% of the survey participants had bank accounts, the banking frequency did not indicate that the rural SMEs were frequent customers of

formal banks (See figure 5.1). Around 185 SMEs (35% of the survey participants), those had bank account bank monthly only once. Moreover, there were SMEs those only banks yearly once (12%) and SMEs those only opened an account but never bank (2%). However, in total, 170 SMEs (30%) were found those banks, weekly once (See figure 5.1).

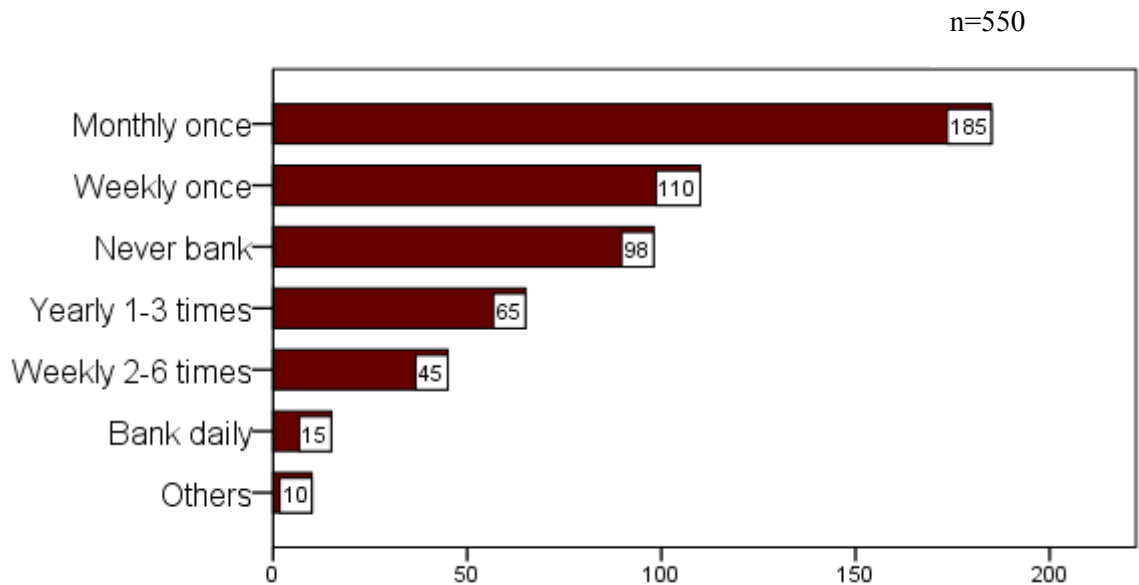


Figure 5.1: Banking frequencies

5.2.2.3 Satisfaction with current banking system

Table 5.4: Comments on banking satisfaction n=550

	Frequency	Percentage
Dissatisfied	241	43.8
No comment	84	15.3
Satisfied	221	40.1

The survey results indicate that 44% of the survey participants were dissatisfied and 40% of the survey participants were satisfied with their banking system (see Table 5.4). However, another 15% of the survey participants did not comment on their banking system. Various reasons were identified behind the dissatisfaction of SMEs with the banking. These are as below:

Table 5.5: Reasons for being dissatisfied *n=550*

	Number	Percentage
Banks do not offer SME account/loans	217	32.2
No private bank service	131	19.5
Banking timetable unsuitable for business	117	17.4
Bank is very far	112	16.6
No SME banking	82	12.2
Others	14	02.1

5.2.2.4 Support provided to the start-up of SMEs by Banks

The statistics on banking support in the start-up of SME indicate that rural SMEs were mainly owners' personal initiatives. Around 70% of the survey participants informed that their businesses were established by owners' own money or funded by family and friends (see Table 5.6).

Table 5.6: rural SME finance statistics *n=550*

	Number	Percentage
Personal or family arranged money	457	69.6
NGO	114	17.4
Government banks	36	05.5
Private banks	29	04.4
Micro-credit	15	02.3
Local money lenders	5	00.8
Other investors	1	00.2

Second supporter in the start-up of SME business was the NGOs, around 17% SMEs received investment by NGOs. The statistics indicate that government banks were unfavourable to the rural SMEs, only 5.5% of the SMEs were funded by government banks (see Table 5.6). However, though private banks do not operate in the rural villages, 4.4% SMEs received private bank's investment in business start-up. These owners are found to have more link to the city or to have a private bank account in the city.

5.2.2.5 Banking services used by the SMEs

The most common banking services used by the rural SMEs were deposits (243), withdrawals (185), micro-credit repayments (102) and utility payments such as gas, electricity and water bills (138) (see Table 5.7). Another 17 participants informed that they had used telegraphic transfer (TT) service to send money to their city based wholesalers. Moreover, 80 SME owners/managers had to deposit/transfer money to others' businesses, such as paying wholesalers/suppliers in advance for future supplies the goods.

Table 5.7: Banking service used by SMEs *n=550*

Services	Number	Percentage
Savings	243	44.18
Withdrawals	185	33.63
Utility payment (gas, electricity)	138	25.09
NGOs' micro-credit loan repayment	102	18.54
Bank deposit for SMEs suppliers	80	14.54
Government and private bank loan payment	59	10.72
Telegraphic transfer (TT) Service	17	03.09
Demand draft service	14	02.54
Pay salary	8	01.45
Others	4	00.72

5.2.2.6 Alternative ways of banking

Besides the formal banking services, unbanked SMEs and dissatisfied with banking SMEs were also found to have alternative ways of banking. The most popular alternative was keeping money at home (309) (see Table 5.8). The second alternative was the NGOs and the micro-credit agency accounts (285). Some SME owners/managers also invested their idle money as money lenders to another business or to friends and family members (47). Desire to earn interest on the savings, motivation to put the savings away for the future and fear of misuse of their savings act as triggers to invest money, according to the informants. However, some alternative ways of

banking in rural area were found risky, such as using the others' bank account (15) and banking with local money lenders (12) (see Table 5.8). These methods are subject to cheating, fraud and money being locked away, according to the informants.

Table 5.8: Alternative way of banking

	Number	Percentage
Save money at home	309	46.1
Bank with NGO	285	42.5
Invest money	47	07.0
Use others' bank account	15	02.2
Local money lenders	12	01.8
Other	3	00.4

5.2.3 Participants' mobile phone adoption and usages of mobile phones

M-banking is a banking service delivered via a mobile phone. Therefore, the discussions on mobile phone adoption, network preference, use of the mobile phones and knowledge of what can be done using mobile phones are important considerations in m-banking development.

5.2.3.1 Mobile phone ownership

In this research *mobile phone ownership* is defined as the participant had a personal mobile phone and he/she could use it without any problem. In the survey more than 90% of the participants had mobile phones (see Table 5.9), which is much higher than home phones and computer ownership in the 4 villages, as informed by the local informants, such as a College Professor, a NGO expert and a banker.

n=550

Table 5.9: Mobile phone ownership

Status	Number	Percentage
Mobile phone owner (sole ownership)	494	89.0
Not an owner but use others mobile phone	36	06.5
Not an owner but prospective buyer	12	02.2
Cannot afford a mobile phone	3	00.5
Not interested in owning a mobile phone	2	00.4
Other	3	00.5

5.2.3.2 Mobile phone usage

Mobile phone usage data show that SME owners/managers use mobile phones for communication, entertainment and utility purposes (see Table 5.10). Among these usages voice communications for personal (94%) and business use (61%) are the main use of mobile phones. Besides voice communication, 57% of the participants informed about using SMS to family, friends and business partners. Typical uses for entertainment are listening mp3 songs (43%), listening radio (23%) and watching video songs (1%) (See Table 5.10).

Table 5.10: Use of mobile phone among SMEs

Use		Number	Percentage
Communication	Voice call for personal conversation	519	94.36
	Voice calls for business conversation	333	60.55
	SMS for personal or business	248	45.09
Entertainment	Listen mp3	238	43.27
	Listen Radio	127	23.09
	Video Songs	76	13.82
Shopping	Buy songs and music	143	26.00
	Buy ringtone	84	15.27
	Buy wallpaper	58	10.55
Utility Service	Pay electricity bill	47	08.55
	Transfer money using a mobile phone	18	03.27
	Browse the Internet	15	02.73
	Transfer money as airtime	2	00.36
	Pay water bill	2	00.36
Others mobile phone usage		8	01.45

Another finding indicates that some SME owners/managers were already using mobile phones for transactional services, such as paying electricity bill (47), paying water bill (2) and airtime transfer (2) (see Table 5.10). Participants mainly buy airtime as credit and use the airtime to pay utility bills or to buy songs and ringtones. However these findings are important as all the experiences of transactional services using a mobile phone will impact positively in adopting m-banking by the rural SME owners/managers.

5.2.3.3 Knowledge on the mobile phones among the survey participants

In this research, the knowledge on the mobile phones among the SME owners/managers was realised by their ability to read\write SMS, check mobile phone balance and ability to top-up pre-paid credit voucher. The information is obviously exciting for the m-banking providers, as the statistics show that more than 57% of survey participants can read\write SMS, check balance and recharge pre-paid voucher (see Table 5.11).

Table 5.11: Knowledge on a mobile phone among rural SMEs

		Frequency	Percentage
Ability to do SMS	Yes	285	57.0
	No	215	43.0
Ability to do balance check	Yes	438	87.6
	No	62	12.4
The ability to recharge pre-paid card	Yes	329	65.8
	No	171	34.2

5.2.4 Participants' knowledge, opinions and intention to use m-banking service

This section presents the survey participants' knowledge and views on m-banking.

5.2.4.1 SME owners/managers' previous knowledge on m-banking

Table 5.12 Previous knowledge on m-banking *n=550*

	Frequency	Percentage
Aware	238	47
Unaware	154	30
Unsure	105	21
Used and currently use m-banking service	6	01

It is encouraging that 47.6% of the survey participants already knew about m-banking service (see Table 5.12). Furthermore, very limited, but not negligible number (6) SME owners also used m-banking service (see Table 5.12). However these SMEs have more relation to the city.

5.2.4.2 Benefits of using m-banking for SMEs

SME owners/managers had reported several benefits of using m-banking comparing to their existing branch banking system. According to the survey, opportunities to apply SME loan for business (n=440), migration from unbanked to the formal banking system (n=343), easy banking with the city based suppliers for the raw products and inventory (n=130), easy salary transfer (n=81) are some key benefits of using m-banking (see Table 5.15).

Table 5.13: M-banking benefits and advantages for SMEs

	Frequency	Percentage
Opportunities to apply business loan for my SME	440	80.00
Open a bank account for my SME	343	62.36
Easy money transfer to city based dealers	130	23.64
Transfer salary easily to my employees	81	14.73
Save time in branch banking that can used in my business	79	14.36
Secure money	68	12.36
No benefits for my SME	20	3.64
Other benefits	5	0.91

5.2.4.3 Concern and barriers in using m-banking to the rural SMEs

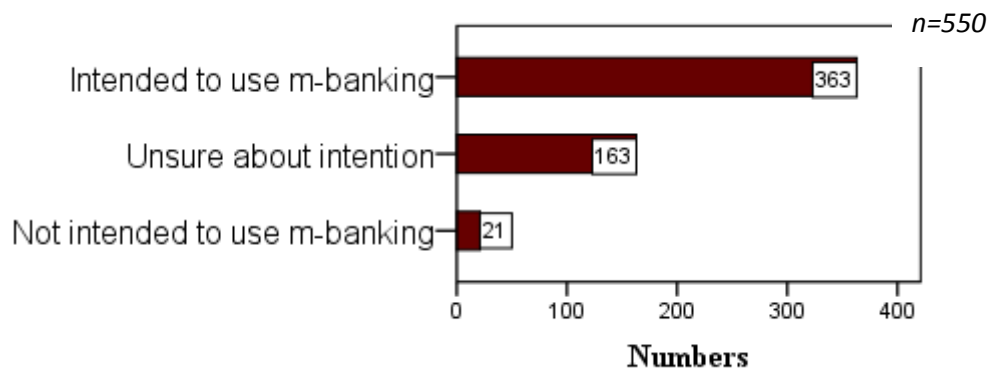
The survey participants identified several barriers in m-banking adoption for rural SMEs. Barriers such as inability to use the internet (n=189), lack of English (n=135), inability to read and write SMS (n=135) are associated with the SMEs that might impact on using m-banking (Table 5.14). Mobile phone barriers, such as small keyboard (n=80), small screen (n=78), slow internet on mobile phone (n=19) are also reported. Interestingly cognitive barriers such as a safety concern (n=40), fear of losing money (n=11) and distrust on m-banking (n=08) are reported by a small number of participants in adopting m-banking. However, the m - banking fee a concern to 15% SME owners/managers (Table 5.16).

Table 5.14: Barriers in m-banking adoption

	Number	Percentage
Inability to use the internet	189	34.36
Lack of reading and writing in English	135	24.55
Inability to read and write SMS	135	24.55
M-banking fees and service charge	112	20.36
Small keyboard of mobile phone	80	14.55
The smaller screen of mobile phone	78	14.18
Safety of money in m-banking	40	07.27
Unsuitable mobile phone for SMS	36	06.55
Slow internet on mobile phone	19	03.45
Fear of losing money	11	02.00
Trust on m-banking	8	01.45
Other concerns in m-banking service	4	00.73

5.2.4.4 Intention to use m-banking service

Among the 547 accepted responses, 66% participants (n=363) were found intended to use m-banking and these are intentional. Another 30% participants (n=163) were not sure and thus were indecisive (see figure 5.2). However, only 4% (n=21) had no intention to use m-banking and were no-intention customers regarding their potential use of m-banking. Participants who had no mobile phones, very small SME owners/managers, such as tea stall, tobacco shops and hawkers were found no-intention customers.

Figure 5.2: Participants' intention to adopt m-banking

5.2.5 Hypothesis testing

Multinomial Logistic Regression (MLR) was used in the analysis since the dependent variable is a trichotomous variable (intentional, indecisive and no-intention customers

(Hosmer Jr., Stanley & Rodney 2013). MLR is a statistical technique that can be applied to situations involving more than two choices in a criterion variable. Mathematically, MNL analysis estimates the log-odds ratio to compare levels of the criterion variable.

The presence of a relationship between dependent and independent factors is based on the statistical significance of the final model chi-square. In this analysis (Table 5.15), the distribution reveals that the probability of the model chi-square (66.974) was 0.000, less than the level of significance of 0.05 (i.e. $p < 0.05$). Thus the result suggests a statistically significant relationship between independent factors, banking satisfaction ($p = 0.001 < 0.05$), perceived credibility ($p = 0.000 < 0.05$) and cost ($p = 0.009 < 0.05$) and the dependent variable.

Table 5.15: M-banking variables testing using MLR

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Banking satisfaction	620.267	13.852	2	.001
Advantages for SMEs	607.499	1.084	2	.582
Perceived usefulness	607.557	1.142	2	.565
Perceived ease of use	609.511	3.096	2	.213
Perceived risk	609.058	2.643	2	.267
Perceived credibility	625.805	19.390	2	.000
Perceived cost	615.753	9.338	2	.009

The proportional by chance accuracy rate is computed by squaring and summing the marginal Percentage in each group ($0.038^2 + 0.298^2 + 0.663^2 = 0.529$). The proportional by chance accuracy criteria is 65.5% ($1.24 \times 52.9\% = 65.5\%$). The classification accuracy rate is 68.6% which is greater than the proportional by chance accuracy criteria of 65.5%. The criterion for classification accuracy is satisfied.

Parameter Estimates of MLR compares the effect of each variable on three groups, intentional, indecisive and no-intention customers (see Table 5.16). The independent variable banking satisfaction is significant in distinguishing the no-intention customers and intentional category ($0.002 < 0.05$). A one-unit increase in the variable banking satisfaction is associated with a 0.789 decrease in the relative log-odds of being in no-

intention customers versus intentional. Banking satisfaction also plays a role in segmenting the no-intention customers and indecisive category ($0.005 < 0.05$).

Table 5.16: Hypothesis testing by comparison using MLR

Category	The reference category	Factors	B	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
						Lower Bound	Upper Bound
Unintentional	Intentional	Banking Satisfaction	-.789	.002	.454	.273	.758
Indecisive	Intentional	Credibility	-.564	.000	.569	.432	.749
		Cost	.165	.006	1.179	1.049	1.325
Indecisive	Unintentional	Banking Satisfaction	.737	.005	2.091	1.245	3.512

(Only significant variables are shown for space consideration)

The independent factors credibility ($p=0.000$) and cost ($p=0.006$) are found differentiating the indecisive and intentional category. The parameter estimates also inform that each unit increase in credibility, the odds of being in the group of indecisive decreased by 25% ($0.749 - 1.0 = -0.251$). For each unit increases in cost, the odds of being in the indecisive group increased by 32.5% ($1.325 - 1.0 = 0.325$). This indicates that survey respondents who perceive m-banking is costly are more likely in the indecisive group, rather than in the intentional group.

Non-parametric techniques such as Chi-square test are ideal when the dependent (Intention to adopt m-banking) and the independent factors (gender, age, level of education, occupation, income and SME category) are both categorical. In this research the Chi-square test results suggest that the age ($p=0.656$), occupation ($p=0.228$) and income ($p=0.731$) have no effect on the intention. But gender (0.000), education (0.001) and SME category ($p=0.000$) have a significant effect on the intention. It is found using SPSS crosstab that participants running a small tea stall, tobacco shop or Rikshaw (tri-cycle) puller show a lower intention to adopt m-banking.

5.2.6 Evaluation of the model

To assess the soundness and the effectiveness of the model the researcher conducted the overall model evaluation, statistical test of individual predictors and goodness of fit statistics. The details are as below:

5.2.6.1 Overall model evaluation:

A logistic regression model is expected to provide better fit to the data if it improves over the intercept-only model. Intercept-only model is also called null model with having no predictors. Intercept-only model serves as a good baseline because it contains no predictors (Peng et al. 2002). In this research the likelihood ratio chi-square of 66.974 with a p-value<0.000 indicates that the model as a whole fits significantly better than an empty model (model with no predictors).

5.2.6.2 Goodness of Fit

Goodness of fit statistics assess the fit of a logistic model against the actual outcome (Peng et al. 2002). In this research the goodness of fit is measured by one inferential and two descriptive measures. To assess the goodness of fit of all variables in the model, Pearson chi-square was obtained. Pearson chi-square is significant as $p < 0.000$. The pseudo R-square statistics was measured by Cox & Snell and Nagelkerke R. Cox & Snell is 0.120 and Nagelkerke R is 0.153 (Table 5.17). The number indicates a modest improvement in fit over the baseline model.

Table 5.17: Goodness of fit and Pseudo R-Square

	Chi-Square	df	Sig.
Pearson	795.527	574	0.000
Deviance	560.527	574	0.648
Cox and Snell	0.120		
Nagelkerke	0.153		
McFadden	0.084		

5.3 Focus group (m-banking provider) data analysis and results

The focus group research results and major themes are as below:

5.3.1 Advantages of using m-banking by the rural SMEs

According to participant 4, the rural SMEs conduct banking mainly with the national banks and post offices in Bangladesh. He also informed that besides banks, rural SMEs also maintain banking with the NGOs and informal banking, such as illegal micro-credit, the local moneylender. The rural SMEs owners maintain bank accounts for both personal and business use. Cash deposit, withdraw and loan repayments are some common banking services they use. Some also use telegraphic money transfer (TT), demand draft (DD) and long term savings. The focus group participants pointed to some advantages of m-banking for rural SMEs as below:

5.3.1.1 Improved banking system for rural SMEs

According to all the participants of the focus group, there are a huge number of unbanked SMEs in rural Bangladesh. M-banking offers a potential solution for the millions of SMEs in rural Bangladesh that have a mobile phone, yet remain excluded from the financial mainstream. Some SMEs may also shift from using illegal banking to legal banking. The SMEs demand of quick money transfer, instant availability of the fund and the flexibility of banking also can be provided, according to participant 3 and 4. Traders can deposit funds overnight for safe keeping. The SME specialist made his comment on this particular point by saying:

“Rural SMEs are normally run by one person; banking in office hours is difficult to manage. Moreover, formal banking is time consuming and does not allow transaction whenever required. This constraint forces them to keep their money under the pillow. M-banking will give the flexibility to do banking anytime and anywhere.”

Another SME senior staff added to the picture by stating that:

“SME owners think if he put the money in the bank, next day when the money will require in Naraygonj in a deal, it might be time consuming to withdraw the money again. They do not have enough cash to deposit the money for even 1 day as they are going to use the money the next day.”

Participant 8 added SMEs m-banking use will save some time for them, which is used in travelling to city for banking. M-banking can also assist female entrepreneurs, as going out for banking for females is not easy in Bangladeshi culture. But using m-banking, females can do banking living inside the house.

5.3.1.2 The opportunity to offer private bank's service to rural SMEs

Private banks (PBs) are more SME focused than the government banks in Bangladesh. Moreover, International donors and the government provide loans through them. But PBs are city based. According to the Head of IT,

“It is our structural constraint that we (banks) cannot operate in the rural areas, but using m-banking we can bring the services to the doorstep of the rural customers”.

According to participant 3, the opportunity will allow banks to develop a close relation with the rural SMEs. Banks can identify well-performing SMEs and finance for enterprise growth. At the national level, SMEs' m-banking use can create better financial transparency in Bangladesh. SMEs can bring a good amount of ideal money to the national banking channel.”

5.3.1.3 The opportunity to create employment by the bank

The m-banking head of the focus group added that m-banking would create job opportunities as the service requires pay points to operate. Educated villagers can work at the pay point and this can be a direct benefit of m-banking in rural SMEs.

5.3.1.4 Improved rural-urban SME business

In Bangladesh reliable money transfer was an obstacle to rural-urban SME supply chain. Especially the fishermen, farmers and vegetable growers had no other options without selling their product only in the local market. But now, rural SMEs have the opportunity to sell the products to city based big buyer, as buyers can transfer money to rural SMEs using m-banking, the participant 3 informed the author. To add to the advantages, as one IT executive noted to the author:

“M-banking allows rural SMEs easy settlement of business transactions for raw materials from the suppliers. The suppliers prefer direct money transfer rather than a personal cheque since cheque take more than two days to clear. Other methods of money transfers such as post office transfer, telegraphic transfer and demand draft issued by the bank are costly and time consuming for SMEs.”

5.3.1.5 Better control of finance of SME

Participant 3, the SME expert, added an important advantage of m-banking use by the rural SMEs:

“I have seen many SMEs collapsed as the owner could not maintain the cash of the business. As SMEs leave on the cash economy, owners always have the money in their access. Sometimes SMEs owners misused the money or were forced to spend by their wives, family member or friends. But m-banking can give them proper control of the cash; even m-banking can hide their wealth.”

5.3.2 Macro and organisational favourable factors

Some organisational and country-level success factors foster m-banking adoption for the rural SMEs in Bangladesh, according to the focus group participants. Below are some highlights:

5.3.2.1 Ready mobile telecommunication infrastructure

A ready mobile telephone infrastructure covering nearly 99% villages, continuous reduction of mobile phones price/ SMS cost and increasing popularity of m-commerce are some contextual factor for m-banking growth in Bangladesh. Participant 8 supported by saying:

“Our mobile phone network reached the last mile of the village. Earlier, the education department has circulated public examination results using SMS to the student. These all actually promoted us to adopt m-banking for the rural users”

5.3.2.2 The central bank’s initiatives

Recently the central bank initiated a project to offer banking service to the unbanked population, such as farmers and SMEs. This project actually forced citybased banks to establish branchless banking in the rural areas using m-banking. Moreover, the government, the central bank had shown great interest in creating policy and procedures for m-banking in Bangladesh, the participant 7 informed.

5.3.2.3 Creating focus on m-banking

The focus group participants informed that the bank placed m-banking around its policy makers’ objectives. The top management supported the project and aligned with the organizational objectives. The participant 1, m-banking head informed the author that, instead of integrating m-banking with the mainstream channel, the bank attempted the service as a standalone channel. This allows creating a special focus to the rural SMEs segment. The standalone approach enabled the bank to create a new vision and business model for m-banking, adapt the organization to the new requirements of the m-banking systems. The project started with new focus, people, process and structure.

5.3.2.4 Engagement with the SMEs

The focus group participants, especially the participant 4 considered the bank's involvement with the SMEs had increased the proposition to adopt m-banking for the rural SMEs. He supported with his statement:

“We serve more SMEs than a non-SME bank. We have more interaction with them, which provides us more knowledge about SMEs. So we are better positioned to design an SME version m-banking. We know better what are the needs of SMEs in credit, fund transfer, fund encashment.”

5.3.2.5 IT competency of the bank

The bank started IT usage by installing computers for the front desk tellers. The primary purpose was ledger maintenance, cash management and cash dispenser etc. Later the bank adopted ATM, off line transaction processing and inter-bank fund transfer facility. The latest services offered using IT are real time online banking, electronic fund transfer, centralized processing, website and m-banking. The systematic integration of computing system provided the bank a sophisticated level of IT competency. This factor, according to the participant 1 is an organisational capability of the bank if offers m-banking for the rural SMEs.

5.3.2.6 SMEs competency

Huge diffusion of mobile phones among SME owners and SMEs' higher banking literacy can be some critical success factors in m-banking adoption for the rural SMEs in Bangladesh. Previous experience of sending and receiving money using air time recharge also can create some interest in SMEs to use the service. Participant 8 commented:

“They might have no education at all but they know various banking terms. They learn these in their profession. So it is not hard to teach them how to do banking using a

mobile phone. Even if they do not know they will learn it from someone, the way they have learned mobile phone operating,”

5.3.3 Obstacles in m-banking implementation

The following obstacles have been identified as existing within m-banking adoption in Bangladesh. So, consequently the obstacles can inhibit the incorporation of m-banking by the SMEs.

5.3.3.1 MTOs reluctance to make partnership with small banks

Not all the MTOs are coming forward in m-banking adoption. MTOs prefer big banks only since small and niche banks are not an attractive partner in m-banking adoption. Participant 1 considers this as an impediment in offering m-banking to rural SMEs

“We only made an agreement with one MTO. Some of the MTOs did not agree to make partnership with us. MTOs limited cooperation thus can prevent some SMEs to use our service.”

5.3.3.2 Operational obstacle

The post-implementation obstacles revolve around the operational issues in m-banking. According the mobile money head,

“The main problem is the money management in the system. Cash transfer between the agents and the bank has become an increasing issue in m-banking. Sometimes, an agent become empty of cash and another agent is overflowing with money. Now we have to transfer cash between them. How the physical money will be transferred to another pay point or after the business hours how the additional money will be taken to the main bank is a challenge for us. The agent cannot take this large deposit to his home neither will it bring any profits.... as the money should be taken to the bank.”

5.3.3.3 M-banking agent management

In the case of rural area, the problem is more severe as not adequate security is available to make the m-banking cash safer. As banks are employing more agents, a new challenge for the bankers is to ascertain the agents' integrity and professionalism. Fake currency, money laundering, illegal money transfers are also common in Bangladesh. It is a problem for the implementer to monitor the agents continuously.

5.3.3.4 SME's limited knowledge of technology

Though mobile phone diffusion is very high among SMEs, even in the rural area, SMEs may not have enough technical skills to operate m-banking, especially in the rural area. One participant was quoted as saying:

"The limited technical knowledge can hinder old and illiterate SMEs in using m-banking. In pilot studies of m-banking, we found semi-literate consumers had more problems with m-banking use."

5.3.3.5 SMEs' shared phone usage

Participant 4 pointed shared mobile phone usage as an obstacle by saying:

"When I inform SMEs about the m-banking, some of them are concerned about the sharing phone. They suspect, as their phone is a shared phone, that others may know their bank details. Despite our explanation on the matter, some of the SMEs still do not convince."

5.3.3.6 Conceptual understanding of banking using a mobile phone

The new mobile phone users in Bangladesh might find difficulties in understanding how a mobile phone can store money? Moreover, some new migrants to the formal banking channel might have problems understanding the banking system using a mobile phone.

They imagine unexpected problems that may arise in future. Participant 1, 3 and 6 have expressed the obstacle in this research.

5.3.3.7 Competition with illegal money transfer

The focus group participants considered illegal money transfer in rural Bangladesh as an obstacle in m-banking adoption for SMEs. Participant 6 commented:

“SMEs have been using local money lending system and micro-credit system for a long time. As SMEs are not always successful in receiving loans, they maintain a relationship with the informal banking. SMEs have an established relation to the illegal system. Now m-banking, being a new system may face competition from these parties. ”

5.3.4 Recommendations

Various recommendations have emerged from the participants with regard to the m-banking adoption:

- First of all, all focus group participants emphasized on an SME version m-banking. Furthermore, the m-banking account should be integrated with other bank accounts of the SME customers. The money transferred by m-banking should be available to use instantly by the SMEs. The SME expert supported by saying:
“We have to remember a business account is used differently than a personal account. SMEs are different from an individual person.”
- The head of IT emphasized that Since MTOs are very conservative in selecting partnering banks; government should make proper policy for the partnership. The policy should also indicate the duties of all parties involved in the system to ensure a win-win situation for all stakeholders.
- Interoperability in m-banking service is required as multiple SIM usage is very common in Bangladesh. The m-banking provider banks should be asked to make partnership with all existing MTOs, so that customers can perform banking even they change their mobile network service.
- The government should implement an SMS price policy to make the service attractive to the SMEs.
- The dispute resolution should be quick. Government should also look after the security issues and monitor the security systems of the m-banking providers. The mobile money head commented:

“This is growing market, if a customer loses his money, it will spread all around and it will hard to develop the market”.

- Participants also suggested that pay points agents have to be educated and knowledgeable on product, network and infrastructure. They also should be given enough remuneration to make them happy and enthusiastic. Participant 5 commented

“We have to work with the pay point agents as they are at the root level of operation. We will have to realize them their responsibility as a banking agent because it is not easy to become the agent of a bank and do the transaction, there is greater responsibility in these tasks.”

- To date all the banks advertise the advertisements separately. Participants suggest that the banks and Telco’s should deliver the advertisement jointly. Even they suggest government can advertise about the service as the government has more acceptance than the banks or MTOs. Customers have to be motivated and organization should create awareness. However, the participants agreed that a special focus on the poor and illiterate people should be given. The participant 2 commented

“As this service is allowing to reach the poor people, and they are very simple and do not know much about the systems, we must make sure they are not cheated. And their interest is well taken care”.

- Lastly, a recommendation for an international or at least Southeast Asian m-banking platform that will enable SMEs to trade with nearest countries, such as India, Pakistan or Nepal.

5.4 Interviews (Bankers, MTO officers and expert representatives) results

The following sections represent the findings of the interviewees’ perceptions with regard to the m-banking adoption for rural SMEs in Bangladesh.

5.4.1 Rural SME in Bangladesh

SME2 introduces the rural SMEs as follows,

“Though Bangladesh is an agricultural country, over the last two decades rural citizens are found interested in non-agricultural initiatives such as selling products or services, establishing handy crafts, setting up looming, and engaging in fisheries projects. These are rural SMEs.”

The RE1 (IT researcher) comments create a more detail profile of rural SMEs,

“These initiatives are mainly taken by younger generations, as income from land is not enough now-a-days. SMEs are mainly the entrepreneur’s personal initiatives. Therefore these businesses do not have any organizational structure and business documents. Though they have a preliminary target market and business strategy, these are not documented, rather in the business owners’ mind. These businesses are small and usually unregistered”.

5.4.1.1 Rural SME banking

The senior managers of the banks-BM1, BM2, BM3, BM3, BS1, BE1, BE2, BE3 and BO1- and the SME experts SME3 informed that rural SMEs mainly bank with government banks, post offices, NGOs and micro-credit organizations. However, these formal banks are mainly located in the *hut* and *the bazaar* (business center), those are far from the villages. SMEs operating in the villages usually keep financial relationship with the informal local money lenders. Furthermore, all interview participants informed that a good proportion of rural SMEs in Bangladesh are still unbanked. The interviewee, SME2 (SME researcher) comments explored SME banking more clearly,

“Rural SMEs are not bank-focused. They might have bank accounts, but for day-to-day banking or transactions, SMEs do not rely on banks. They keep money in their house, shops or bank with local money lenders. Formal banks are not available in most of the villages.”

5.4.1.1.1 Rural SME banking activities

As informed by the interviewees, the main banking activities of rural SMEs are as below,

5.4.1.1.1.1 Loan and Credit facility and loan

The BM3 and BS2 commented on the SMEs loan and credit facility,

“Loan is the first service the rural SMEs owners/managers seek from a bank. They come to our bank from a long distance, expending the transport cost to get loan information. They want loan for the working capital, business expansions or to overcome critical situations such as a business loss.”

5.4.1.1.1.2 *Savings*

BM3, BE3 and SME3 informed that some SMEs also do small savings for future purposes, such as children's education, daughter's marriage or business expansions. However, the informants BS2 comments are contradictory to the BM3 and BE3. The BS2 commented,

"If the SME owner has extra money, instead of keeping in the banks, he/she investments the money in land or cattle. Some also earn interest by lending informally to friends or family members. The informal lending returns more interests than the formal banking sectors."

5.4.1.1.1.3 *Cash check*

The BS2 commented on the usage of bank cheques among rural SMEs by saying,

"Some rural SME owners/managers come to the banks to cash bank cheques, given by their clients or suppliers. The bank cheque is given to them as the SMEs are unbanked or have accounts with has different bank to the suppliers."

5.4.1.1.1.4 *Remittance service*

According to the informant BE3, a good number of rural SMEs use transactional services such as telegraphic transfer, pay order and demand draft. He commented,

"The rural SMEs are highly depended on the city based wholesalers and suppliers. The wholesalers and the suppliers are strict on the payment schedule, so rural SMEs owners/managers come our branches to transfer money to the wholesalers account."

5.4.1.1.2 Reasons behind rural SMEs poor banking

Below are some reasons identified by the interviewees for rural SMEs' poor banking:

- Government banks' inadequate support to the rural SMEs (SME2 and BM2).
- Private banks are more SME focused but reluctant to open branches in the villages (BM1, BM2, BS1, BE2, BO and SME2).
- The inconvenient location of branches for the SMEs (SME2, BM1 and BS2).
- Unsuitable timetable of the banks' for SMEs (BM1, BM2, BS1, BE2 and BO1) (Please refer to 5.3.1.1).
- Dominance of informal banking sectors in the rural areas (SME2 and BE2).
- Rural SMEs smallness and inability to return a good profit compared to the establishment cost of a branch (SME2, BM1, BM2, BS1, BE2 and BO2).

5.4.1.1.3 Rural SMEs banking needs

Furthermore, the interviewees suggested some critical banking needs of the rural SMEs,

- A convenient way of banking and banking guidance on how to use finance to grow their businesses (BS1, BE2 and RE2).
- Finance to SME owners for their child's education and marriage and to overcome financial constraints (SME2, BM1, BM2, BS1, BE2 and BO2).
- Technology based banking as branch banking is not suitable for them (SME2).
- Support to get rid of the informal banking systems as these are very expensive, yearly interest can be 60-70% (SME2, BM1, BM2, BS1, BE2 and BO1).
- Private banking services to rural SMEs as private banks have more customized products and services for the SMEs (SME2, BM1, BM2, BS1, BE2 and BO2).
- Better transaction service and inter-bank transaction as rural SME owners/managers' need to transfer money to city based wholesalers (SME2, BM1, BM2, BE2 and BO3).
- SMEs need a safer method of investing their money SMEs (BM1, BM2 and BS1).

5.4.1.2 Rural SME's mobile phone adoption

All interview participants confirmed that mobile phone adoption has proliferated in recent years in rural areas of Bangladesh. Mobile phone is rapidly becoming a feature of rural people's culture, especially in the communication, interaction and entertainment.

Voice call for the personal communication and business communication is the dominant use of the mobile phone in the rural areas of Bangladesh as informed by MT1, MT2, MT3, RE1, RE2, SME1 and the IP4. The SME2 commented that rural citizens also play mp3 music, watch video, listen radio and use the camera for shooting photos. The use of internet browsing and social media has also increased among the young generations as informed by participants MT1, RE1, MT2, and SME1. Furthermore, the use of mobile phone based services such as buying music, paying utility bills, applying for university admission using SMS have become popular in the rural customers.

5.4.2 M-banking advantages

The interview participants suggested various advantages of m-banking for banks, MTOs and the SMEs. These are as below:

5.4.2.1 M-Banking advantages for the rural SMEs

M-banking has several benefits to offer SME, banks and MTOs. The advantages are as below.

5.4.2.1.1 SMEs' opportunity to bank with formal banks

Without any exception, all interview participants pointed that the main advantage of m-banking is the opportunity to offer banking services to many rural unbanked SMEs. The interviewee SME2 (SME researcher) supported this benefit with his following statements,

“In rural areas there are millions of unbanked SMEs those significantly contributing to the economy of the country. However, these SMEs are not attractive clientele to the traditional banks as these businesses are very small and generate little profit. However, using m-banking, banks can provide banking to these businesses without setting up a branch.”

5.4.2.1.2 Support SME business by accelerating business transactions

BE2, BS1, BS2, MT2 and MT4 identified that m-banking can accelerate SME business in Bangladesh by providing time-saving inter-bank transfers and easy international money transfers. The BE2 commented,

“M-banking is a solution of the time consuming inter-bank transfer and complicated international money transfer in Bangladesh. Offering m-banking, we can support SME businesses in inter-bank transfer and international transfer and that can be affordable to the poor SMEs.”

Furthermore, the IT researcher RE2 pointed that m-banking is an opportunity to link Bangladesh to the global economy too. He quoted

“SMEs export Garments, shrimp, frozen vegetables and IT outsourcing services. However complicated banking system, especially foreign currency transfer has been a barrier in the export. M-banking can solve the problems of SMEs and connect them to the global economy.”

5.4.2.1.3 Opportunity to decrease illiteracy, increase technical literacy of SME owners/managers and facilitate IT adoption

The participant BM2 considered m-banking adoption in the rural SMEs will increase SMEs' literacy. He also informed use of m-banking will promote SME owners to use other mobile phone based services available in Bangladesh. He commented.

“The m-banking service is a self-operated service and it requires SMS. Therefore the users must need numeracy to use this service. This eventually promotes the users to learn numeracy, even some will attempt to learn English, in case English is required.”

5.4.2.1.4 Opportunity to expand business with the help of the formal banking system

BM2, RE1, SME1, SME2 and SME3 suggested that using m-banking, rural unbanked SMEs will have the opportunity to grow and expand their businesses with the support of formal banking systems. The RE1 commented on this theme,

“There are some good businessmen in the villages, but they do not have the vision or enough cash to expand their business. Banks can identify them and create a vision among them to extend their business. Furthermore, banks can fund them to grow into industry.”

5.4.2.2 M-banking advantages for the banks

M-banking advantages for the banks, as suggested by the interviewees are summarized below:

5.4.2.2.1 Small and new banks opportunity to increase customer base

The researcher RE2 suggested that banks who were struggling to increase customers can offer m-banking to increase customer numbers. The participants confirmed that

huge numbers of SMEs are still unbanked. The following quote from the interviewee gives a clear view of this:

“Not all the banks are performing well; some of them are critically struggling to increase customers. Most of them are new banks. M-banking is opening a door to the new banks. The new banks can aim at offering m-banking to the unbanked to increase their customer numbers.”

5.4.2.2.2 M-banking increases low-cost customers, brings more deposits and generates more profits

The bank managers BM2 and BM3 identified that m-banking customers are low-cost customers as banks do not need to set up a branch to offer banking to them. Both the interviewees suggested that m-banking is an opportunity for banks to retain customers and increases deposits and as a result generates more profits for banks. On this theme, a participant BM3 (a bank manager) indicated his reservations saying:

“Our main function is to collect deposit and provide that deposit as loan. However, we always have a crisis in deposit collection, which actually greatly depends on only urban customers in Bangladesh. However, offering m-banking we can collect deposits from any corner of Bangladesh without having a physical branch, if we offer a good interest rate.”

5.4.2.2.3 Bank’s organizational improvements using m-banking

M-banking can provide several organizational benefits to banks in Bangladesh, such as improved customer service, better management and decreased operating cost. One example of such understanding came from a bank manager (BM1) who commented:

“M-banking can be very beneficial in conducting banking activities more effectively and efficiently. As an example, using m-banking existing customers have real time banking information. Therefore they will not call us to know their account balance and we will have more time to concentrate to any serious matter. Thus m-banking can increase employees’ productivity. There will be improvement of the customer - bank relationship too.

The BM3 and BIT1 both confirmed that m-banking can decrease operating cost of a bank. On this theme, a participant BM3 (a bank manager) indicated his reservations saying:

“Now all customers come into our branch so we need more human resources. Moreover, we have to be available for them even after office hours. However, using m-banking they can manage or solve some banking issues by themselves, such as transfer money from one account to another. Therefore, we will require less human resources and less operating hours.”

The bank executives BE1 and BE4 identified that, m-banking will improve bank's customer service by saying,

“Most of the banks offer telephone based customer service, but still the branch is the best option to receive customer service in Bangladesh. Customers usually come to a branch and stand in the queue for a long time only to know his/her account balance. However, if we can offer m-banking and a customer can manage his/her account, it will increase our customer service.”

According to the BM3, m-banking will help the bankers to save some time that is used in answering customers' inquiries,

“In Bangladesh bank officers normally provide their mobile phone numbers to the clients. As soon as the client gets the number, the bank officer becomes the first contact person to the client. Without any offense, the clients call any time for their account information. However, if he can know that information using m-banking, he will not call the banker.”

5.4.2.2.4 M-banking increases brand image of the banks

M-banking has immense opportunities to positively influence a bank's brand image and perception as informed by the BM1, BM2 and MT3. The BM1 supported by saying:

“A bank spent millions of taka (local currency) to build the brand image. But if you can offer a cutting edge service like m-banking, customers are definitely talking to each other about the bank and define your brand image as advanced banking.”

In addition to the above statements, MT3 comments can be added,

“When a bank will open a branch in a new village or district, unlike before when we had to create customer base, we will have some customers from the m-banking channel. Using m-banking, banks can spread their name to future customers.”

5.4.2.3 M-banking advantages for mobile telecommunication operators (MTOs)

The interview participants from the MTOs also identified following advantages for the MTO.

5.4.2.3.1 Generates profits besides voice communication service

According to ME1, ME2, ME3 and ME7 m-banking can bring profit besides voice communication in the present mobile telephone market. The ME1 commented, “The mobile phone market in Bangladesh is monopolized by few big MTOs. New entrants are struggling with retaining their customers. These MTOs should look towards profit which is more than the voice call charge. It became essential that we use their network for further revenue. Mobile based service such as m-banking is an opportunity to generate income. Moreover, the number of rural SMEs is lucrative for the MTOs to offer m-banking.”

5.4.2.3.2 Increase loyalty and decrease SIM drop ratio rate

M-banking offers MTOs to retain their customers by decreasing the SIM drop ratio as informed by the ME2. SIM drop ratio refers to user’s stopping their usage of a SIM for various reasons. The ME2 informed the researcher that customer’s m-banking adoption creates an extended relation with the MTO. Customers will recharge the SIM to use m-banking that was used before inconsistently.

5.4.3 Macro-level m-banking factors for rural SMEs in Bangladesh

Macro-level m-banking factors consist of organizational factors and country-level factors. Therefore, macro-level factors are categorized into two sections:

5.4.3.1 Country-level factors

5.4.3.1.1 Huge mobile phone adoption and quick development of mobile technology

Huge mobile phone adoption in Bangladesh was identified as the significant country-level success factor by the informants BM2, BM3 and RE2. The BM3 commented, *“The explosive growth of mobile phone in Bangladesh over the past ten years is the opportunity for banks to leverage mobile phone to offer banking services to the rural SMEs. In Bangladesh where significant numbers of SMEs are unbanked, airtime can become another form of currency. Imagine you need to transfer a small amount of money to your wholesaler or supplier who lives in the city or far from you. The easiest way to transfer money is to use your mobile phone, which is already in your thumb”*.

5.4.3.1.2 Customers’ acceptance of other mobile phone based information systems

Introduction of various mobile phone based information systems in Bangladesh and customers’ acceptance of those technologies was a country-level factor for m-banking adoption in Bangladesh, as suggested by BM2 and BM3. The BM1 supported with his claim by saying,

“Mobile phone is no more only a voice communication device in Bangladesh. Rather, the mobile phones is used for various purposes such as application for university admission, electricity payment using mobile phone air time credit and download favourite songs/ringtones. These usages of mobile phone actually can be a promoter of m-banking for rural SMEs. Peoples now in Bangladesh already are familiar with various usages of mobile phones.”

5.4.3.1.3 Countrywide demands to improve SME banking

The respondents from the banks - BM3, BO1 and BO3 - and the researchers RE1 and RE2 confirmed that there is an obvious countrywide demand to improve SME banking. The RE1 supported the market demand by saying:

“Our customer service experience and interaction with SMEs confirm that demand for SME banking has increased in Bangladesh. Demand also remains high for village based SMEs due to unavailability of suitable SME banking in the rural Bangladesh.”

5.4.3.1.4 Central bank's initiatives to support m-banking

The informants TE & RE, RE2, BM1, BM3, BIT2 and MT1 considered that Bangladesh Bank’s (the central bank) aim to encourage and support m-banking had sparked the m-banking development in the country. BM1 commented,

“Central bank realizes that ICT has a lot to offer in the Bangladeshi banks and had taken various ICT developments such as CIB online, centralized database and lastly m-banking development. Moreover the central bank has taken quick steps in developing policy and procedures for m-banking. Therefore banks are in a position to offer m-banking.”

5.4.3.1.5 Inconvenience of banking in Bangladesh’s political instability

Banking is inconvenient and sometimes is not possible in situations of political unrest as banks are forced to close their doors. Therefore, branch managers BM1, BM2 and BE3 suggested that would promote m-banking usage among SMEs. According to the RE2,

“Bangladesh is highly politically unrest country. In the situation of political strikes and chaos banking is not possible and safe in Bangladesh. Furthermore, countrywide lack of law and order, high traffic jam in the cities are barriers to branch banking. However, for the SMEs banking is very important, so if we can offer m-banking, businessmen definitely will come forward to adopt the service.”

5.4.3.2 Organizational critical success factors

5.4.3.2.1 Poor banking services for rural SMEs

The SME1 and ME2 suggested that the existing provision of banking to rural SMEs is poor and this will prompt SMEs to adopt m-banking. The ME6 commented,

“In Bangladesh rural SMEs have less access to the formal banks and money transfer for business is very complicated. I have seen a lot time rural SME owners/managers travel a long distance only to withdraw money or to deposit money into another account. So naturally, rural SME owners/managers will adopt the service that allows him to transfer instantly and easily.”

5.4.3.2.2 Supportive organizational environment

The RE2, who was involved with the ATM development in Bangladesh, suggested Bangladesh has a supportive organizational environment for m-banking development by saying,

“Bangladesh is a small land and there is a professional connection between the corporate citizens. Therefore, organizing a collaborative service is not hard. Moreover, business behaviour and culture promote partnership in Bangladesh. You will see same investors own the banks and the MTOs, so the partnership among organizations is quite easy. As an example, look at ATM service, you will easily understand the mutual environment in Bangladesh.”

5.4.3.2.3 High availability of IT professionals

In Bangladesh Software engineering, computer science and IT are the first choices for higher education to the students. Therefore, each year a good number of IT professionals join the banking and Telco sector. To SME2 and RE2, the availability of m-banking experts will foster m-banking adoption in the banks and MTOs. Furthermore, RE1 and BM1 informed that IT educated manager play a role of catalyst in the adoption of IT based services in the banks.

“Banks and MTOs are among the most attractive places for job seekers in Bangladesh. Banks recruit officers from different educational backgrounds. These IT educated officers, though they work in banking, plays as a promoter of computerization and IT adoption in the banks. They provide new ideas to the top management in the adoption of IT in various banking functions. Moreover, new generation employees are more mobile savvy and great admirer of m-banking.”

5.4.3.2.4 Increasing literacy among new generations of SME owners/managers

The informant RE2 suggested that young SME owners have higher education and the increasing the literacy level will prompt m-banking adoption among them. He commented,

“In Bangladesh primary school has been compulsory, so young generations of SME owners are more educated. These SMEs have more knowledge on mobile phone usage and less resistance to the technology. They represent around 40% of the entire population. The higher proportion of new generations will definitely embrace m-banking.”

5.4.4 Barriers in m-banking adoption

The barriers identified by the interviewees are as below:

5.4.4.1 Rural SMEs' lack of banking awareness of banking benefits

SME owners' lack of awareness of the banking advantages was cited as the significant barrier in m-banking adoption by most of the interviewees. According to them, the majority of rural SMEs are unaware of the banking benefits for businesses, hence will be a challenge to convince them to bank using m-banking. The participant BE1 supported by his statements,

"SMEs are not aware that banking has several benefits for businesses, such as support in cash flow shortage, short-term fund to expand the business and operational efficiency using the transactional services. Therefore a lack of awareness of banking advantages is a main barrier in m-banking adoption for the rural SMEs in Bangladesh".

5.4.4.2 Lack of banks' and MTOs' effective leadership and limited vision on m-banking

This view is mainly received from the researchers and the lower level officers of the banks. The informants RE2, BE1 and ME2 identified lack of leadership and vision of some banks can be a barrier in adoption of m-banking in those banks. According to RE2,

"M-banking has significant advantages for banks and MTOs. However, only limited numbers of banks are offering m-banking. Therefore, we can assume that local and smaller banks are not focused on m-banking. If the managers are not aware of the benefits of m-banking and do not come forward in the adoption, they will miss the opportunity."

However, participants from IT management (BIT1 and BIT2) were more convinced that senior management intervention could have a positive influence on the adoption rate of m-banking. They argued that support from senior management is the most important factor for m-banking implementation.

5.4.4.3 M-banking providers' competencies

The informants, BM3, ME2, RE2 and ITP3 were not confident that all Bangladeshi banks have IT and organizational strength to offer m-banking. The interview participant BE1 informed that not all the Bangladeshi banks have technological competencies, human resource capabilities and organizational strength to offer m-banking. These banks are local, new and small. He further informed that these banks previously aimed to increase customer numbers by offering e-banking. However, they failed to adopt e-banking and technological incompetency was one of the reasons, as informed by BE1.

5.4.4.4 Problems managing m-banking stakeholders

M-banking is a joint service offered by banks and MTOs. Furthermore, agents, content providers and central bank actively participate in the system. According to BIT2 and BE2, stakeholders, especially agent management, can be a barrier in the rural areas in Bangladesh.

"Look at the numbers of involved parties in m-banking system, now if communication is failed in one part of the channel, it will negatively impact on the entire system. Moreover, the agents are required in rural area. I am not sure how m-banking providers will manage them as rural agents might not perform as expected."

5.4.4.5 Psychological barrier

BE1, BS1, BS2, MT1, RE2 and SME2 suggested m-banking is a new way of banking and rural SMEs hesitation to bank using a mobile phone can be a barrier in m-banking adoption. BS2 commented,

"Some SMEs, may not understand the virtual system and will feel a lack of trust on m-banking. It could be hard for them to believe that money can be stored in a mobile phone. The psychological standpoint can be a barrier in m-banking adoption. Furthermore, the old generation and existing happy banking customers may find the transition unnecessary."

5.4.4.6 Security

The SME1 identified two perspectives of security in m-banking, demand side and supply side security. He referred demand side security as how the users are securing their banking information such as account number, PIN number and secrete questions. On the other hand, provider's side security is the security provided by the bank/MTOs network. However, security could be a barrier in providing m-banking for the rural SMEs, as expressed by the BIT2 and BM3. He commented,

“In rural areas cash of m-banking transactions are managed by the agents. However, it is not easy to maintain the security of cash in the rural areas. So security could be a barrier in providing m-banking in rural areas.

5.4.5 Recommendations

Various recommendations were provided by the interviewees to adopt m-banking among rural SMEs in Bangladesh. These are as below:

5.4.5.1 Government's intervention

BM2 suggested that government should intervene in the m-banking project to create openness, fairness and understanding among the stakeholders of m-banking by saying,

“In Bangladesh banks and MTOs are overseen by two different ministries finance ministry and telecommunication ministry. Therefore, government should intervene and ensure all necessary stakeholders are included in the m-banking project, the responsibilities of the stakeholders are defined and the commissions are structured among stakeholders. Therefore, we will have less organizational conflicts and increased understanding among the stakeholders”.

5.4.5.2 Awareness development among SMEs

Awareness development among the rural SMEs has been suggested as one of the significant recommendations by bank interviewees BM3, BS1, BE2 and technology experts MT1, ME4, RE2, RE2. As one participant BM3 stated:

“M-banking is a new concept to many of the rural SMEs. Consequently, the rural SMEs might find difficulties to understand how a mobile phone can store money. Therefore, we need to inform them about the introduction of the service and also to make aware of the service”.

5.4.5.3 Banks and MTOs capabilities checking

The informants, BM3, ME2, RE2, ITP1 and ITP3 suggested that provider's capabilities should be checked before giving them m-banking license. The ITP3 commented on this theme,

“Look, technologically Bangladesh is not an advanced country. So it is important to see what IT system the bank has before allowing them to operate m-banking. If they do not have enough IT infrastructures, we can ask them to improve or outsource the IT service outside of the organizations.”

5.4.5.4 Improve legislation to protect customers

In order to increase customer trust, the MT2 and ME2 recommended to improve legislations. The MT2 commented,

“M-banking inherits risk from both banking and from telephoning, as well as new risks that are unique to m-banking. Moreover it is a new service for the Bangladeshi banks too. Therefore, we should have enough law to protect the customers. It has to define whether banks or Telco will be responsible in the case of security breach. We need to ensure, banks/telcos have enough technical, and human resource capability to handle security breach. We also need to see what policy the partnered bank or Telco has regarding security.”

5.4.5.5 Real time inter-bank transaction

ME1 and MT2 pointed that m-banking should be real time online banking without any service fee.

“In Bangladesh inter-bank transaction is time consuming. M-banking can increase its acceptance among businessmen by offering real time inter-bank transfer. M-banking also should not charge any fee to promote the service. Early adoption requires significant enthusiasm and demand technological risk taking mentality. So the SMEs those adopt m-banking should be rewarded as they can do a lot of marketing.”

5.4.5.6 Research and knowledge sharing

M-banking is a new concept in Bangladesh. Therefore BM3, RE2, SME1 suggested to conduct more research on m-banking to understand the service more accurately. RE2 commented,

“We know now how to install and run the service. But still we do not know much about SME money management and banking practices. We should know more about them, especially rural SMEs. If the m-banking service does not meet the banking demands of the rural SMEs, apparently, will not adopt it. Moreover, as several stakeholders participate in m-banking, joint research and knowledge sharing are important in m-banking”.

5.4.5.7 System quality

System quality was identified as another significant issue and recommended by MT2, RE2, BM3, ME1 and BO1. However Participants ME1 comments implicitly suggest the likely rejection of m-banking if it is complicated to use and makes the banking harder.

“The system must be user friendly. As soon as users see the menu, they should understand what to do. If the system is complicated and requires a lot of learning to use, users might not adopt the service. We also should consider voice based or image based m-banking system.”

Furthermore, MT3 suggested to increase the m-banking features gradually for the rural SMEs.

“We must have to offer a lot of features in m-banking so that rural SME owners/managers can perform all banking activities without visiting a branch. However, the features should be gradually increased in m-banking system. Otherwise it will be like throwing them in a sea.”

5.4.5.8 Security

Security in m-banking was identified as another significant recommendation by most of the interviewees. The BM1 commented,

“We are new to m-banking, so we still might do not know what security is missing. However, we have to be proactive to increase the security of m-banking.”

5.5 Conclusion:

This chapter analyzed the data collected in the survey, interview and focus group. Analysing these data results, the MLR presents poor banking facility, cost, credibility, gender, education and SME business type are the main customer perspective factors that significantly influence the intention of SME owners and managers to adopt m-banking. The findings suggest that the most important advantages of m-banking for rural SMEs comprise improved banking facility, easy settlement of trade, and an improved SME business environment due to faster transactions and better cash management. On the other hand, for banks and MTOs, m-banking can generate profits, improve customer

service and management, decrease operating costs, increase brand image and create employment in rural areas. The findings with respect to organizational factors suggest that having an m-banking project within the bank's/MTO's objectives, their level of engagement with SMEs, the technology and human resource capabilities of the banks, the development of mobile infrastructure, and top-level management's support are important in m-banking development. However, barriers to providing m-banking to the rural SMEs include lack of banks' effective leadership, limited vision regarding m-banking by the stakeholders, MTOs' reluctance to make partnerships with new banks, and m-banking providers' competencies and security. Country-wide factors identified included concern over lack of proper policy and regulation in Bangladesh.

Chapter 6

Discussions

This chapter is the discussions of the data that was collected for this research. The chapter has 2 sections. The first section discusses the rural SME owners'/managers' banking problem, mobile phone adoption and m-banking awareness. The second section answers the research questions of this thesis. The chapter develops the m-banking framework for the rural SMEs in Bangladesh.

6.1 Introduction

In this chapter, the results of data analysis from the survey, interview and focus group are discussed. The discussion will answer all the research questions of this thesis. With the synthesis of previous literature and the data analysis of this research, this chapter develops an m-banking framework that includes all possible micro-level customer perspective factors of rural SME owners/manager and the organization and country-level factors. This will lead to a new understanding on m-banking adoption in Bangladesh for rural SMEs.

6.2 Discussions on rural SMEs in Bangladesh

This discussion draws on findings about rural SMEs business characteristics, owners'/managers' profile, banking constraints and mobile phone adoption. The findings were discovered through surveys with the SME owners/managers, focus group with a bank that provides m-banking as well as interviews with bankers, MTOs officers and SME experts.

6.2.1 Findings: Rural SME business characteristics

This research found the following characteristics of the rural SME businesses in Bangladesh.

- The rural SMEs in Bangladesh had small investments and a small number of employees (findings from interviews with the SME experts and the survey, see Table 5.1).
- The rural SMEs are usually unregistered and run by the owners (findings from survey, see Table 5.1)
- Rural SMEs cover a wide spectrum of industries (Findings from the Interviews and Focus group).
- SME initiatives are mainly taken by younger generations (Findings from the Interviews and Focus group).
- The SMEs are informal and do not have any organizational structure and business documents (Findings from the Interviews and Focus group).
- The rural SMEs are not well-supported by traditional banks (Findings from the survey, focus group and the interviews).

The findings of SME business characteristics are very similar to the studies by Ardic, Mylenko & Saltane (2012), Beck & Demirgüç-Kunt (2006), Davis et al. (2010), Harvie (2004), Levy (1993), Khan et al. (2012). These studies also highlighted that SME businesses are small, poor, informal and banking deprived. However, this research contributes to the body of knowledge by informing the similar business characteristics of SMEs in 4 villages in Bangladesh.

6.2.2 Demographic profile of rural SME owners/managers

The survey, focus group and interview data have painted a detailed picture of the rural SME owners/managers in Bangladesh in this thesis. The demographics — consisting of gender, occupation, education, age and income — help to broaden our understanding of rural SME owners/managers and their banking problems. Furthermore, the data contributes greatly to the investigation of the most appropriate m-banking framework for the rural SMEs in Bangladesh. For example, SME owners/managers income level would impact on the intention to use m-banking because of the cost of the service.

Gender distribution

That most SME owners' participation in the survey were male (86%), which implies that rural SME sector in Bangladesh is mainly operated by males. The female SME owners mainly operate from home. Therefore female participation in the survey was lower as the survey for this study was conducted in the main market of the village.

On this topic, Tambunan (2009) reported that the representation of women entrepreneurs in developing countries was relatively low. Another study by Jamali (2009) also reported lower rates of female entrepreneurs in a developing country. However, it was impossible to ascertain the number of women SME operators working from home. It was therefore impossible to verify Tambunan (2009) and Jamali (2009).

The findings from gender distribution suggest that m-banking providers in developing countries, specifically in Bangladesh have to carefully consider their marketing strategy to reach the female SME owners in Bangladesh.

Age distribution

In the survey the dominance of younger age bracket SME owners (proportion under age 40) will facilitate m-banking adoption for rural SMEs. This is because young generations are more aware and familiar with the latest mobile phones and the functions of mobile phones (Carroll et al. 2007). They are considered a technologically savvy group (Teo & Pok 2003). Moreover, young users represent early adopters of the technologies and they focus the gratifications of technology in the context of everyday life (Pedersen & Ling 2003). Lastly, as shown in this research, the participation of other age brackets indicates that m-banking providers have the chance to offer the service to all age categories.

Income distribution

The income of the survey participants indicates the rural SME owners earn very little and that is less than the national average of payment. The income statistics also reveal that a large number of SME owners and managers cannot afford to buy a computer and internet. Therefore, m-banking providers have a greater chance to include rural and poor citizens, as they have no access to Internet banking. Moreover, studies by Aker & Mbiti

(2010), Bangens & Soderberg (2011), Chavan et al. (2009), Dunmcombe & Boateng (2009), Medhi, Ratan & Toyama (2009) established that m-banking as suitable banking for poor and rural citizens in other developing countries, e.g. Kenya, Uganda, Tanzania and India.

The low income level informs us that SME owners and managers need low cost (even possibly no cost) accounts. As they earn less, they will save only small amounts and need micro credit opportunities.

Education distribution

The survey demonstrates that rural SME owners/managers in the 4 villages have a satisfactory educational attainment (about 90% had completed primary school or above and almost all were literate). The satisfactory academic profile undoubtedly is very motivating for the m-banking provider. The findings in this research suggest that literacy will not be a barrier in m-banking adoption in Bangladeshi rural SMEs. Furthermore, other researchers have already suggested that higher level of literacy and education facilitated m-banking adoption in other countries (Leishman 2010, Ndiwalana, Morawczynski & Popov 2010).

6.2.3 Findings: Rural SMEs banking

The rural SMEs in Bangladesh mainly bank with government banks, post offices, NGOs and micro-credit organizations, according to the survey, interviews and the focus group data. Apart from these formal banking channels, SMEs also bank with NGOs and informal money lenders in the villages.

The main banking activities of the rural SME owners/managers were the deposit and withdrawal for personal and business purpose, as realised by the survey. Deposits was mainly for loan repayments, micro-credit payments and utility bill payments such as gas, electricity and water bills. Businesses such as convenience stores & grocers, agriculture & fertilizer business, garment stores and Pharmacies also deposit money to whole-sellers' and suppliers' business accounts. Transitional services such as telegraphic transfer (TT) were also used to transfer money to their city-based

wholesalers. Some SMEs also required converting bank cheques and demand drafts into cash in the bank. Apart from banking, rural SME owners informed in the survey that they required banking information for SMEs.

The sample of rural SME owners/managers in the 4 villages participated in the survey expressed that the traditional banks were not supportive enough of their SMEs. Around 20% of the SME owners were unbanked SMEs, 43% were unhappy with their banking, most banked infrequently and there was a huge use of informal banking channels. Thus these findings depict the poor banking facility for the SMEs. Moreover, the focus group and interview participants also supported the fact that rural SMEs in Bangladesh did not receive enough support from the traditional banks in the start-up of their SMEs.

The findings of poor banking services for the rural SMEs substantiate studies that reported banking constraints in the developing countries SMEs (Ardic, Mylenko & Saltane 2012, Beck & Demirgüç-Kunt 2006, Harvie 2004, Levy 1993, Nichter & Goldmark 2009, Rahman, Rummana & Zinia2012). This research contributes to the body of knowledge on SMEs banking by informing that rural SMEs in Bangladesh, despite their contributions to the national economy are in the segment of those deprived of sophisticated banking facilities.

6.2.4 Findings: rural SMEs owners'/ manager' mobile phone usage

The survey, interview and the focus group confirmed that mobile phone adoption has proliferated in recent years in the rural areas of Bangladesh. The mobile phone is rapidly becoming a feature of rural people's culture, especially in communication, interaction and entertainment. The survey demonstrates that mobile phones are the technology of choice for the SME owners/managers (90% of the survey participants had mobile phones).

The survey conducted in this research suggests that SME owners/manager in the 4 villages were successfully using mobile phones for voice and SMS communication.

Mobile phones were also used as the source of entertainment, such as playing mp3, music and radio and shooting photos with the camera. Furthermore, some SME owners/managers were already using mobile phones for transactional services, such as paying electricity bills, paying the water bill and airtime transfer. However these findings are important as all the experiences of transactional services using a mobile phone will impact positively in adopting m-banking by the rural SME owners/managers.

In this research, knowledge of the mobile phones among the SME owners/managers was realised by their ability to read\write SMS, check mobile phone balance and the ability to top-up pre-paid credit voucher. The information is obviously exciting for the m-banking providers, as the statistics show that more than 55% of survey participants can read\write SMS, check balance and recharge a pre-paid voucher.

The findings of huge mobile phone adoption in the 4 villages and the use of mobile phones by the rural SME owners/managers are very similar to studies by Chipchase and Tulusan (2006), Ndiwalana, Morawczynski and Popov (2010). Another study also reported that the use of mobile phones by the SMEs in the developing world contributed towards the improving access to communications (Frempong 2009).

6.2.5 Findings: SME owners'/managers' previous knowledge on m-banking and intention to use the service

The survey data indicated that rural SME owners/managers already knew about the service. Kirui, Okello and Nyikal (2010) and Higgins, Kendall and Lyon (2012) also reported higher level of m-banking awareness among farmers and SMEs. A higher rate of awareness obviously will facilitate m-banking adoption.

The statistics of intention to adopt m-banking is also impressive. It will excite the government, banks and m-banking providers to offer m-banking service. Among the 547 accepted responses, 66% of participants (N=363) intended to use m-banking and these are intentional. Another 30% of participants (N=163) were indecisive (see figure 5.7). Unbanked SME owners/managers, female owners/managers and participants with

lower education were found indecisive regarding their potential use of m-banking. In m-banking, education has two aspects: firstly illiterate people find the service unsuitable from a literacy standpoint and, secondly, people from a lower educational background may not understand the usefulness of banking. However, only 4% (N=21) had no intention to use m-banking. Participants who had no mobile phones, owners/managers of very small SME, such as tea stalls, tobacco shops and hawkers were found to be no-intention customers. Moreover, this research shows an alarming issue that unbanked and dissatisfied banking customers do not have the intention of adopting the service.

6.2.6 Conclusion

The finding of poor banking services for rural SMEs implies that there is a need to expand the banking services in the rural villages of Bangladesh. M-banking may be a way to resolve this banking problem for rural SMEs in Bangladesh. This is because research studies conducted in developing countries suggested that SMEs banking constraints can be improved by using m-banking (Bångens & Söderberg 2011, Higgins, Kendall & Lyon 2012, Kirui, Okello & Nyikal 2010, Kumar, Martin & O'Neill 2011, Morawczynski & Pickens 2009). More interestingly perhaps Mas and Ng'weno (2012), suggested that informal businesses in developing countries seem to be a more appropriate sector for m-banking usage than formal large enterprises and businesses.

Mobile phone adoption by rural SME owners/managers suggest that this device is the most suitable way to offer them electronic banking. This is because mobile phone ownership is much higher than private ownership of home phones or computers in the surveyed area. Furthermore, mobile phone ownership among rural SMEs managers and owners informs us that they adopt a technology if the technology has a use and is affordable to buy and maintain. Lastly, mobile phone usage indicates that the rural SMEs owners had sufficient knowledge — such as writing and reading SMS, entering numeric values to top up the pre-paid charge and hearing mobile credit balance — to operate m-banking.

6.3 Discussions on R.Q 1: Benefits of m-banking

Using data from the survey, interviews and a focus group study, this research examined various advantages of m-banking for rural SMEs, banks and MTOs (see Table 6.1). Advantages are discussed below.

6.3.1 M-banking benefits for rural SMEs

The key advantages of m-banking for the rural SMEs, as identified in this research, can be summed up as follows: banking improvement for rural SMEs, SME business improvements, support on SMEs' finance and Owners/managers personal improvements by using m-banking.

First of all, this research empirically establishes that m-banking as a suitable banking system for rural SMEs, particularly in Bangladesh. This is because m-banking has the potential to offer low cost virtual bank accounts to the poor SMEs, to the informal businesses and tradesmen, to women, to those living at the bottom of the society and to the farmers. M-banking can provide better banking facilities to the SMEs who are currently dissatisfied with their banking. Formal banking can be extended to the rural areas to eradicate the informal banking systems. Lastly, by using m-banking SME owners can open business accounts that will increase the relationship between business and banks and assist SME to obtain business loans.

The findings are consistent with those studies that suggested that SMEs banking constraints in the developing countries can be improved using m-banking (Bångens & Söderber 2011, Chavan et al. 2009, Higgins, Kendall & Lyon 2012, Kirui 2010, Kumar, Martin & O'Neill 2011, Mas & N'gweno 2012, Medhi, Ratan & Toyama 2009, Ndiwalana, Morawczynski & Popov 2010). Like SMEs in Uganda (Ndiwalana, Morawczynski & Popov 2010, Ndiwalana, Morawczynski & Popov 2010), Tanzania (Bångens & Söderberg 2011) and Kenya (Mas & N'gweno 2012), SMEs in Bangladesh also can benefit substantially from using m-banking.

Table 6.1: M-banking advantages for rural SMEs

Advantages		Source of data	Reference
Improve rural SMEs banking	Opportunity to bank for the unbanked SMEs	Focus Group	(Bångens & Söderber 2011, Chavan et al. 2009, Higgins, Kendall & Lyon 2012, Kirui 2010, Kumar et al. 2011, Mas & N'gweno 2012, Medhi et al. 2009, Ndiwalana, Morawczynski & Popov 2010)
	Opportunity to open a business account	Survey	
	SME owners can apply for business loans for their SMEs without the existence of a branch in their locality	Survey and Interviews	
	The private banks can offer SME services to the rural SMEs	Focus group	Key finding of this thesis
Accelerate business transaction of SMEs	Time saving inter-bank transfer	Interviews	(Bångens & Söderber 2011, Chavan et al. 2009, Higgins, Kendall & Lyon 2012, Kirui 2010, Kumar et al. 2011, Mas & N'gweno 2012, Medhi et al. 2009, Ndiwalana, Morawczynski & Popov 2010)
	Easy money transfer to city based wholesalers	Survey	
	Convenient salary transfers to employees	Survey	
	The opportunity to link Bangladesh to the global economy by providing international money transfer using m-banking	Survey	
Improve SME business environment	Faster banking transaction contributes to speedier SMEs business	Survey and Focus group	(Bångens & Söderber 2011, Chavan et al. 2009, Higgins, Kendall & Lyon 2012, Kirui 2010, Kumar et al. 2011, Mas & N'gweno 2012, Medhi et al. 2009, Ndiwalana, Morawczynski & Popov 2010)
	Save time in branch banking that can be used in business	Survey	
	Opportunity to expand business with the help of the formal banking system	Interviews	
Security	Better control of the SME finances Improved security of money	Focus group	(Chavan et al. 2009, Higgins, Kendall & Lyon 2012, Kirui 2010, Kumar et al. 2011)
Owners and managers' personal improvement	M-banking decreases illiteracy, increase technical literacy and facilitates IT adoption	Interviews	Key findings of this thesis
	The increased savings attitude of SMEs owners	Interviews	

This research found that m-banking supports SME business by accelerating business transactions. Therefore, improved banking will result on an improved SME business environment. Time saving inter-bank transfer, easy international money transfer, and the opportunity to link Bangladesh to the global economy are some m-banking advantages for SME business. The findings indicate that m-banking's time-saving factor can support increased sales and more efficient management. SMEs constant battle against poor liquidity can be supported by m-banking usage. Furthermore using m-banking services, the owners can apply for business loans for their SME and control SME finances more securely. Lastly, m-banking decreases illiteracy and increases technical literacy and savings attitude of SMEs owners.

The Improved SME business environment as the result of using m-banking by the SMEs were also reported by Bångens and Söderberg (2011), Ndiwalana, Morawczynski and Popov (2010), Higgins, Kendall and Lyon (2012). However, unlike other studies, this research specifically focuses on the rural SMEs, which is a major contribution to the body of m-banking knowledge.

6.3.2 M-banking benefits for banks, MTO and country

Besides the customers, m-banking is advantageous for the providers too (see Table 6.2). This research explores profitability, increase of the customer base and organizational improvements are some incentives for the banks and MTOs by SMEs adoption of m-banking of m-banking.

First of all, m-banking generates profit for the banks and MTOs besides their core business. The banks can have access to a large number of customers that will help banks to increase deposits. These customers are considered as low-cost customers as banks do not need to establish branches or additional networks. Banks can have access to the potential SMEs and finance them to grow.

At present the mobile telephone market seems to be saturated in Bangladesh and SIM drop ratio by the customers in high, as informed by the MTO officers. Therefore new

MTOs are struggling. However, this research suggests that MTOs can increase customers and retain customers by offering value added services like m-banking.

Banks can improve customer service by providing m-banking as m-banking is capable of providing real time accurate information. Moreover, the migration of rural SME owners to m-banking can free up the bankers from the need to deal with customer service. The freed time will allow bankers to spend more time on other duties. Lastly, m-banking decreases operating cost of a bank because of the need for less human resources and less operating hours and the increased brand image helps marketing of the banks.

Table 6.2: M-banking advantages for banks, MTOs and country

Advantages		Source of data	Reference
Profitable	Generates profits besides voice communication service	Interviews	(Tiwari, Buse & Herstatt 2007, Higgins, Kendall and Lyon 2012)
	Increases low-cost customers, generates more deposit and more profits	Interviews	
Customer increment and retention	Gives small banks the opportunity to increase customer base	Interviews	Key finding of this thesis
	Increases loyalty and decreases SIM drop ratio rate	Interviews	Key finding of this thesis
Organisational improvements	Improve customer service	Interviews	Key finding of this thesis
	Better management	Interviews	
	Increase bank employees' productivity	Interviews	
	Decrease operating cost of a bank by less human resources and less operating hours	Interviews	
	Increase brand image help marketing of the banks	Interviews	
Improvement of the country	The opportunity to create employment by the bank	Focus group	Key findings of this thesis
	Improved rural-urban SME business	Focus group	
	SMEs shift from illegal to legal banking system.	Focus group	

At the national level, m-banking is advantageous for a country by creating employment as agents. The service also improves rural-urban SME business in a country. The

migration from illegal to legal banking system also contributes to the country by increasing the money in the formal economy. Finally the shift will empower SMEs which will empower the Bangladeshi economy.

The notion of organisational and national benefits by offering m-banking is also supported by previous studies on internet technology and electronic banking. For example, Higgins, Kendall and Lyon (2012), highlighted various benefits for banks, such as profitability, increase of the customer-base, improvement of customer service and management, increasing brand image and national benefits like customers shift to the formal banking system. Tiwari, Buse & Herstatt (2007) also examined the opportunities for banks to generate revenues by offering m-banking. However, the study was placed in a developed country's context, but this research contributes by studying a developing country like Bangladesh's context. Another finding — the organizational improvements by implementing m-banking — has been reported rarely by previous scholars. Moreover, increase of customer loyalty to the MTOs and a decrease of SIM drop ratio rate are hardly suggested by previous studies.

6.4 Discussions on R.Q 2: Customer perspective factors in m-banking adoption by rural SMEs

The survey of rural SME owners and managers reveals that poor banking satisfaction, credibility, cost, gender, education and the business type of the SME are significant factors.

Bångens and Söderberg (2011) and Brown et al. (2003) also found poor banking status as an important customer service factor in m-banking adoption. Perceived credibility and cost also referred by Daud et al. (2011), Luarn and Lin (2005), Yao and Zhong (2011) as m-banking factors. The demographic factors, gender and education are associated with m-banking adoption, as suggested by the literature review. Laukkanen and Cruz (2012) and Riquelme and Rios (2010) identified the effect of gender on m-banking adoption.

However, the analysis focuses on the three factors that have been largely overlooked in prior literature. They are: banking satisfaction, m-banking advantages for SMEs, and SME business type.

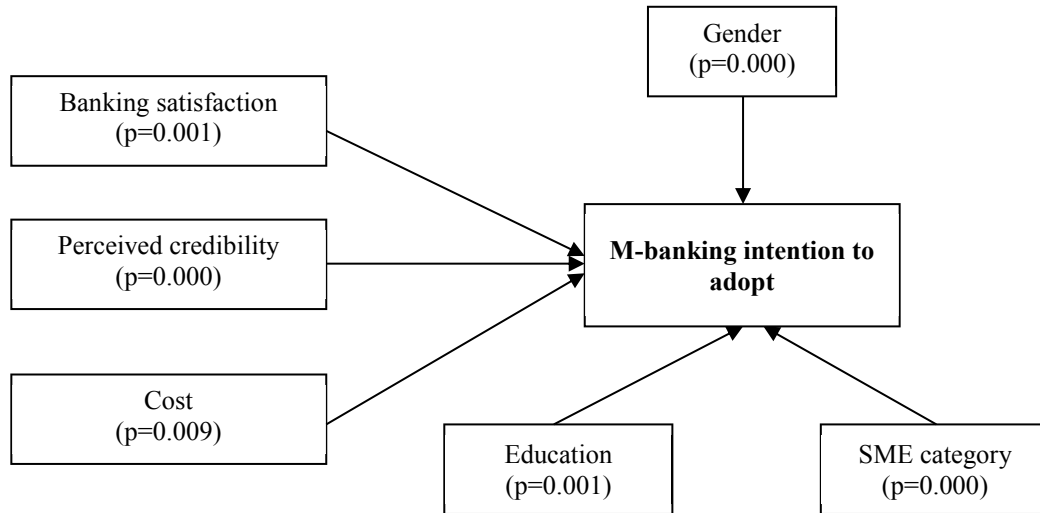


Figure 6.1: Micro-level customer factors based on the survey

6.5 Discussions on R. Q 3: Organisational and country-level factors in m-banking adoption

The literature review of this research established that, apart from micro-level customer perspective factors, macro-level organizational and country-level factors had been argued to explain m-banking adoption in a country. In consequence, the objective of this research was to analyze the role played by organizational and country-level aspects of m-banking adoption. In this way, the framework proposed makes several contributions to the literature including the consideration of both internal and external factors that can effect m-banking adoption.

6.5.1 Organisational factors

From the organizational standpoint, this research shows that several factors associated with banks and MTOs have a positive effect on m-banking adoption in Bangladesh (see Table 6.3). The focus group and one-to-one interviews with the bankers and MTO officers identified several organizational and country-level factors that can promote m-banking adoption for the rural SMEs in Bangladesh. The factors are shown in Table 6.3.

Table 6.3: Organisational factors in m-banking adoption

Organisational factors	Source of data	Reference by previous studies
Bank's engagement with SME market	Focus group	Medhi et al. (2009)
IT competency of the m-banking providers	Focus group	San Martín, López-Catalán & Ramón-Jerónimo (2012), Turban et al. (2004)
Top management support		
M-banking project within the bank's and MTOs organizational objectives	Focus group	Fruhling & Digman (2000)
SMEs' level of sophisticated literacy	Focus group	Key findings of this thesis
Rural SMEs unfavourable support from traditional banking	Interviews	Bångens & Söderberg (2011), Higgins, Kendall & Lyon(2012), Kirui et al. (2010), Kirui et al. (2012), Kumar et al. (2011), Chavan et al. (2009)
Huge IT educated human resources	Interviews	Key finding of this thesis
Increasing literacy among new generations SMEs	Interviews	Key finding of this thesis

Some critical organizational success factors in offering m-banking are: engagement with the target market's, IT competency and top management supports of the bank, m-banking projects within the bank's, MTOs organizational objectives, available IT educated human resources. Furthermore, this study identifies that banking constraints for rural SMEs and SME owners/managers sophisticated literacy are other enabling factors for m-banking adoption for rural SMEs in Bangladesh.

The findings support the extant literature on m-banking that established m-banking as a suitable banking system for individuals having difficulties in accessing banking (Bångens & Söderberg 2011, Higgins, Kendall & Lyon 2012, Kirui, Okello & Nyikal 2010, Kirui, Okello & Nyikal 2012, Kumar, Martin & O'Neill 2011, Chavan et al. 2009). Another finding related to SME owners/managers literacy supports the link between financial literacy and electronic banking (Servon & Kaestner 2008). Furthermore, clients' low levels of literacy, lack of familiarity with technology, and limited exposure to financial products are challenges for many financial institutions when dealing with m-banking (Kendall et al. 2011). Engagement with the target market is another critical success factor in m-banking adoption. The findings actually supports (Medhi, Ratan & Toyama 2009) that knowledge on target market's money management and requirements is an important enabler for the m-banking providers.

6.5.2 Country level factors in m-banking adoption

From the country-level standpoint, this research identifies that Bangladesh is in a privileged position in terms of m-banking adoption. This research identified a ready-made mobile technology infrastructure, central bank's initiatives to offer m-banking to the rural unbanked population and government's quick response in m-banking policy development is some country-level supporting factors for m-banking (see table 6.4).

Environmental context can be described as the arena in which an organization conducts its business within its industry, competitors, and dealings with government (Tornatzky and Fleischer 1990). This research identified inconvenience banking because of the political instability in Bangladesh as an important environment that will prompt business owners to adopt the service in Bangladesh. From the interview participants from the banks, this factor appears as a major constraint in banking, not only for the SMEs but also for the general people. However, prior researches suggested that the country-level environment acts as an external pressure on the adoption of innovation (Awa, Nwibere & Inyang 2010).

Table 6.4: Country-level factors in m-banking adoption

Context	Factors	Source of data	Reference
Environment	Bank closures and inconvenient banking due to political instability	Interviews	(Awa, Nwibere & Inyang 2010) TOE framework (Tornatzky and Fleischer 1990)
Culture	Public's acceptance of other mobile phone based information systems	Interviews	TOE framework (Tornatzky and Fleischer 1990)
Industry characteristics	Countrywide demands to improve SME banking	Interviews	TOE framework (Tornatzky and Fleischer 1990)
Technology support infrastructure	Huge mobile phone adoption and quick development of mobile technology A ready-made mobile technology infrastructure	Focus group & Interviews Focus group	TOE framework (Tornatzky and Fleischer 1990)
Government regulation	Central bank's initiatives to offer banking to the rural unbanked population	Focus group & Interviews	TOE framework (Tornatzky and Fleischer 1990)
	Central bank's initiatives to support m-banking Government's quick response in m-banking policy development	Focus group & Interviews	Key findings of this thesis

The opportunity to bank without visiting a branch provides m-banking a unique characteristic which is very important in Bangladesh where banking is difficult because of the political unrest. Singh & Tigga (2012) also suggested banking using electronic devices provides the Merchants or Traders with a way to avoid the risks involved in handling cash, which are very high in a political unrest situation. Research on m-banking studies also reported that in developing countries, where cash transfer is considered risky, m-banking has provided the convenience of banking without transferring cash.

This research identified two cultural factors — customers' acceptance of other mobile phone based information systems and supportive organizational environment — are important enablers of m-banking adoption in a country. Both factors are reported in the previous IS research studies. As an example, Oliveira & Martins (2010) suggested trading partner collaboration as a significant facilitator for industries in e-business adoption. Furthermore, Karnali and Kurnia (2010) and Kurnia et al. (2013) found good cooperation between trading partners to adopt technologies supported business to business interactions in Indonesia and Malaysia. Prior research by Jenkins (2008), Pousttchi, Schiessler and Wiedemann (2009), Ndiwalana, Morawczynski and Popov (2010) also suggested that, since m-banking is a joint service, a supportive organizational environment is critical for partnership among stakeholders.

SMEs in most of the developing countries, and especially in Bangladesh, are characterised by lower access to banking. Therefore, the demand from the SMEs, SME experts and the banks to provide banking to rural SMEs is a suitable industry characteristic for the adoption of the innovation. This finding is in accordance with prior literature on SMEs' banking constraints. Moreover, empirical research found the demand of the target market has prompted the MTOs to offer m-banking.

Technological context describes both the internal and external technologies relevant to the firm. This includes current practices and equipment internal to the firm (Starbuck 1976), as well as the set of available technologies external to the firm (Thompson 1967, Khandwalla 1970, Hage 1980). The availability of related technologies and infrastructure plays an important role in the diffusion of any technology services, such as m-banking. For example, potential adopters are not required to learn new skills as they have previous experience in operating a mobile phone. Moreover, the formation of a critical mass of technology is not necessary as there already is an available mobile phone network (Dholakia & Kshetri 2005)

The Central bank's initiatives to offer m-banking to the rural unbanked population and Government's quick response in m-banking policy development are two country-level

factors that supported m-banking development in Bangladesh. Both factors are reported by Bångens & Söderberg , (2011), Porteous (2006), Ivatury and Mas, (2008), Weber & Darbellay, (2010). These studies reported that government's invention has facilitated m-banking adoption in Kenya, Tanzania, India and Uganda.

However, it is to be noted that this research identified several factors that were rarely reported by previous m-banking research. Moreover the numbers of factors, both micro and macro are bigger than previous research. This is because the semi-structured interviews allowed our focus group and interview participants to introduce factors different from those included in questionnaire-based research

6.6 Discussions on R.Q 4: Barriers to implementing m-banking for the rural SMEs in Bangladesh

Understanding concerns and barriers are essential in m-banking adoption as understanding of the barriers helps to improve the service. Therefore, this research presents customer perspective rural SMEs' concerns and barriers, banks'/MTOs' organizational barriers and operational barriers associated with m-banking (see Table 6.5 for more details).

Customers perspective on m-banking barriers are: inability to use the internet, lack of reading and writing in English, inability to read and write SMS, SME's limited knowledge of technology and SMEs' shared phone usage.

Several other cognitive barriers are: rural SMEs' lack of awareness on banking benefits, customers' difficulty in conceptual understanding of banking using a mobile phone and trust on m-banking. Some customers also expressed their fear of losing money in m-banking. This finding accords with the studies that suggested a potential link between financial literacy and electronic banking (Servon & Kaestner 2008).

Table 6.5: Concerns and barriers in m-banking adoption

	Barriers	Source of Data	Previous Study
Customer perspective	Inability to use the internet	Survey	(Chemingui 2013, Kirui, Okello & Nyikal 2010, Laukkanen & Lauronen 2005, Laukkanen et al. 2008, Ram & Sheth 1989)
	Lack of reading and writing skills in English	Survey	
	Inability to read and write text messages	Survey	
	SME's limited technological competencies	Focus group	
Phone availability	SMEs' shared phone usage	Focus group	
Cognitive	Rural SMEs' lack of awareness on banking benefits	Interviews	(Laukkanen et al. 2007, Cruz, Laukkanen & Munoz 2011)
	Conceptual understanding of banking using a mobile phone	Focus group	
	Trust and safety of m-banking	Interviews	
Mobile phone barrier	Small keyboard of mobile phone	Survey	(Chan et al. 2002, Chong et al. 2011, Tarasewich, Nickerson & Warkentin 2002).
	The smaller screen of mobile phone	Survey	
	Unsuitable mobile phone for SMS	Survey	
	Slow internet on mobile phone	Survey	
Operational	Difficulty in cash management in rural areas	Focus group	(Higgins, Kendall & Lyon 2012, Kirui, Okello & Nyikal 2010, Morawczynski & Pickens 2009)
	Too many stakeholders' to manage	Interviews	
	Bank's m-banking agent management	Focus group	
Bank and MTOS	Lack of banks and MTOs' effective leadership	Interviews	Key finding of this thesis
	Limited vision of m-banking		
	MTOs reluctance to partner with small banks	Focus group	
	M-banking providers' competencies	Interviews	
	Lack of security in rural areas	Interviews	
Others	High fees and service charge of m-banking		Key finding of this thesis
	Informal banking systems and illegal money transfer	Focus group	

Furthermore, clients' low levels of literacy, lack of familiarity with technology and limited exposure to financial products are challenges for many financial institutions when dealing with m-banking (Kendall et al. 2011). Another study also reported consumers' low level of literacy as an obstacle in m-banking adoption (Kirui, Okello & Nyikal 2010).

Customers' inability to use the internet, lack of reading and writing SMS or limited knowledge on mobile phones are reported by prior studies as a usage barrier in m-banking research (Chemingui 2013, Laukkanen & Lauronen 2005, Laukkanen et al. 2008, Ram & Sheth 1989). Unexpectedly, this research could not find any value barriers in m-banking adoption, as reported by Luo, et al. (2012), Kuisma, Laukkanen & Hiltunen (2007). These studies identified customers' unawareness on m-banking values, such as unsuitability to meet enough of the banking requirements or failure to meet performance-to-price also hinders customers in adopting the service. However, the findings of cognitive barriers in this research are also reported by (Laukkanen et al. 2007, Cruz, Laukkanen & Munoz 2011).

Some limitations of mobile phones also appeared as an obstacle to m-banking usage by the rural SMEs. These are traditional mobile phone barriers such as the small keyboard, small screen of and slow internet on mobile phone. Moreover, some SME owners also informed that they did not have a suitable mobile phone for m-banking. The finding was also informed by previous studies on mobile technology (Chan et al. 2002, Chong et al. 2011, Tarasewich, Nickerson & Warkentin 2002).

Money management, m-banking stakeholder and agent management are some operational obstacles in m-banking adoption. Indeed, lack of adequate float (currency) was also cited in some studies as one of the major constraints of m-banking in remote areas (Higgins, Kendall & Lyon 2012, Kirui, Okello & Nyikal 2010, Morawczynski & Pickens 2009). Therefore to be successful, the barriers such as operational obstacles, money management and security need to be removed. M-banking service providers should consider expanding the availability of sufficient "float" of funds to expedite transfers into and from business communities (Kirui, Okello & Nyikal 2010).

Banks and MTOs' effective leadership and vision on m-banking, MTOs reluctance to make partnership with small and new banks, m-banking providers' competencies and security maintained by the service providers are some organizational barriers of banks and MTOS, as informed by the focus group and interviews from banks and MTOs.

M-banking fees and service charges and competition with illegal money transfer are other barriers identified in this research. Therefore, the Government has to implement the right policy to control illegal money transfer, which seems to be an obstacle in m-banking development. Besides this, m-banking providers should study the unbanked SME owners/manager existing money management to fit m-banking within the sector (Medhi, Ratan & Toyama 2009).

6.7 Discussions on R. Q 5: Recommendations in m-banking adoption by rural SMEs

Various recommendations were provided by the survey participants, focus group members and the interviewees in this research (see Table 6.6). The recommendations can definitely strengthen m-banking adoption among rural SMS. This is because the recommendations are from the key stakeholders, the target market, m-banking providers the banks and MTOs and the SME and technology experts (Jenkins 2008, Porteous 2007, Porteous 2009). However, the main recommendations are for a business version m-banking for SMEs, government's intervention in the m-banking project, policy and regulations development and system improvements.

The recommendation to establish a business version of m-banking that address the specific needs of SMEs was suggested by the focus group members. According to the participants, the business version m-banking should integrate other existing accounts of the customers. The service should provide instant ability to cash the m-banking money and offer real time inter-bank transaction. Another important suggestion by the focus group members was for a harmonized international or at least Southeast Asian m-banking platform. The harmonized m-banking platform will enable SMEs to trade with neighbouring countries, such as India, Pakistan and Nepal. A business version of m-

banking for SMEs was also recommended by Bångens and Söderberg (2011), as most of the current m-banking systems are not designed for business. Furthermore, the researchers suggested increased integration between m-banking and the banking system.

Table 6.6: Stakeholders' recommendations in m-banking adoption

Recommendations		Reference
Business version m-banking for SME	Integrated m-banking account with other bank accounts	(Bångens & Söderberg 2011)
	Instant ability to cash the m-banking money	
	Real time inter-bank transaction	
	An international or at least Southeast Asian m-banking platform	
Government's intervention	Joint advertisement by the banks, MTOs and government	Key finding of this thesis
	Government support in educating pay points agents	
	Banks and MTOs capabilities checking	
	Awareness development among SMEs	
Policy development	A proper policy for the partnership between banks and MTOs.	Key finding of this thesis
	Improve legislation to protect customers	(Bångens & Söderberg 2011, Jenkins 2008, Medhi, Ratan & Toyama 2009, Porteous 2007, Porteous 2009)
	Quick dispute resolution.	
	An SMS price policy for m-banking.	(Kang, Lee & Lee 2012)
System Improvements	System quality and slow increase of features	Key findings of this thesis
	Interoperability in m-banking.	
Others	Research and knowledge sharing	(Jenkins 2008, Medhi, Ratan & Toyama 2009, Porteous 2007, Porteous 2009)

Another important recommendation in this research is the government's intervention in the m-banking project. The interviewees suggested the government should come forward in advertising m-banking, educating the pay point agents and developing

banking awareness of the SME owners on m-banking. Moreover, the interview participants emphasized that the government should actively conduct the competency check on the m-banking providers before allowing the m-banking provider to have a license. However, a recommendation for government's intervention was rarely identified in previous studies.

As expected, the recommendations for policy and regulations development also appeared very important to the focus group and interviewees. Moreover, SME owners also expressed their concerns on trust and security of m-banking. Therefore, smart regulations were recommended to protect customers and also to protect m-banking providers. Other findings are that the tendency and preference to make partnerships with only big and successful banks and MTOs is creating a market monopoly and difficulty for smaller and new banks. Government and policy makers should focus on this issue to allow new ones to flourish, as suggested in this research. Other recommendations on the policy were quick dispute regulation policy and an SMS price policy for m-banking providers.

The recommendations on policy and regulations substantiate the extant studies that focused on the regulation and policy on the m-banking (Bångens & Söderberg 2011, Porteous 2006, Ivatury & Mas 2008, Weber & Darbellay 2010). These studies also suggested decreasing financial risk by introducing customer perspective regulations that establish who owns the account and how access is gained to the account (Klein & Mayer 2011, Mas & Klein 2012). However, regarding the m-banking provider perspective regulations, this research reports similar to Anderson (2010) that suggested regulations to protect existing m-banking providers, to flourish new providers and to avoid market monopoly. The recommendations on m-banking fees and SMS price policy actually reflects the survey participants low income statistics. Previous studies also established that low charges and fees can improve m-banking users' perception of the value of the service (Kang, Lee & Lee 2012).

As m-banking is a technology, the participants in this research suggested that the quality of the system should be appealing. Moreover, they suggested slow increase of the

features in the m-banking features. Interoperability among different m-banking networks was also suggested, as multiple SIM usage is common (Klein & Mayer 2011, Ndiwalana, Morawczynski & Popov 2010). Lastly, as m-banking is a new system in Bangladesh, the research participants recommended for joint research and knowledge sharing on the target market, policy and m-banking system. This finding is similar to the studies by Jenkins (2008), Medhi, Nagasena and Toyama (2009) Porteous (2007) and Porteous (2009).

However, surprisingly, not many recommendations were made on money-laundering and terrorist finance (Mas & Klein 2012). This is because rural SMEs are anticipated not risky by the interview participants.

Chapter 7

Conclusion and future research direction

This chapter summarises the whole research in brief and explores any limitations of the research. The chapter also provides the direction for future research. This chapter has three sections: answers to the research questions, limitations and future research directions.

7.1 Introduction

M-banking is still in its infancy in Bangladesh. M-banking is not on the visible horizon. This empirical research is an effort to navigate through the landscape. In an attempt to make a distinct contribution to the body of m-banking knowledge, this chapter summarises the findings. From the findings, an m-banking framework will be developed, which was one of the main objectives of this research.

7.2 Answers to the Research Questions

This research seeks to answer five research questions with support of the data collected using survey, focus group and interviews. The following section briefly answers the questions.

7.2.1 R. Q. 1: What benefits can be achieved for the rural SMEs, banks, telecommunication organisations and the government by offering m-banking to the rural SMEs in Bangladesh?

This research examined rural SMEs demographics and their banking systems in four villages in Bangladesh. This research demonstrates that m-banking is very beneficial to

the rural SMEs. The main benefits are rural SMEs opportunity to bank with formal banks. Using m-banking, rural SMEs can open business accounts and receive private banks' SME service. Time saving inter-bank transfer, easy money transfer to city-based wholesalers, convenient salary transfer and opportunity for international money transfer using m-banking can accelerate the SMEs' business transactions. Consequently, the faster transactions of m-banking could contribute to the SMEs' speedier business and an improved SME business environment. Furthermore, using m-banking rural SMEs who have accounts in the city can save time. SME owners can expand their business with the help of the formal banking system by using m-banking. M-banking can also contribute to the rural SMEs by increasing owners'/managers' literacy and facilitate IT adoption. Finally, m-banking can increase the savings attitude of SMEs owners.

On the other hand, banks and MTOs can earn profit beside their core business by offering m-banking to the rural SMEs. Small and new banks can overcome deposit constraints by offering m-banking to the rural SMEs in Bangladesh and thus gain access to another source of deposits. M-banking can increase loyalty and decrease SIM drop ratio rate of the MTOS, which will increase customer base and customer retention. However, banks/MTOs can improve their organisations by improving customer service and management, increasing operational efficiency, decreasing operating costs and increasing brand image. Finally, m-banking can benefit a country by creating employment, by improving rural-urban SME business and by shifting rural SMEs from the illegal to the legal banking system.

This research demonstrates that rural SMEs banking can be easily managed by providing m-banking. Therefore, this research suggests banks and financial institutions should target rural SMEs as prospective clientele by offering m-banking. However, according to stakeholders, the benefits and advantages should be advertised to the SMEs through a common platform consisting of bank, MTOs and government.

7.2.2 Answer to R. Q 2: What are the customer perspective factors which influence the intention of rural SMEs to adopt m-banking in Bangladesh?

This research empirically studies the factors that influence the intention of SME owners and managers to adopt m-banking in rural Bangladesh. The survey indicates that poor banking satisfaction ($p=0.001$), credibility ($p=0.000$), cost (0.009), gender ($p=0.000$), education (0.001) and the business type of the SME (0.000) are micro-level customer perspective factors in m-banking adoption. That is, an SME owner/manager who has lower banking satisfaction, higher credibility, higher level of education and lower concern on cost has a higher intention in adopting m-banking.

7.2.3 Answer to R. Q. 3: What are the country-level and organisational factors that impact on implementing m-banking for rural SMEs in Bangladesh?

The research reports on the critical organisational success factors in m-banking adoption. This thesis identifies engagement with the SMEs as an important organisational factor in m-banking diffusion for rural SMEs. This is because a bank needs to understand SMEs' banking needs. The technology and human resource capabilities of the banks, together with top-level management support, can facilitate bank's willingness to adopt m-banking. The lesson learnt by an m-banking implementer (focus group) is that, it is firstly important to consider m-banking as a parallel channel to offer banking services to the rural SMEs in Bangladesh. SMEs level of sophisticated literacy and financial literacy can promote the m-banking uptake. SME's increasing literacy and financial literacy will create an awareness of banking and they will realise their banking needs. Therefore, a bank with an existing physical presence should use the branches as potential advisory centres to educate and encourage SMEs about m-banking. Lastly, rural SMEs' unfavourable support from traditional banking will encourage SME owners to use the new service.

Recently, Central Bank's initiatives to offer banking services have electrified m-banking adoption in Bangladesh. This is because m-banking appeared to be the only way to offer banking to the rural unbanked population. Huge mobile phone adoption, quick development of mobile technology, a ready-made mobile technology infrastructure and customers' acceptance of other mobile phone based information systems positions Bangladesh as one of the best countries for m-banking adoption. Findings from the study suggest that countrywide demands to improve SME banking and the inconvenient banking in the political instability in Bangladesh will promote m-banking uptake. Supportive organisational environments and the government's supportive policy on m-banking are other country-level factors which favour m-banking adoption in Bangladesh.

7.2.4 Answer to R. Q 4: What are the barriers in implementing m-banking for the rural SMEs in Bangladesh?

M-banking has the ability to be transformational for rural SMEs, however, to be successful the m-banking adoption barriers have to be removed. This research found that owners' and managers' inability to use the internet, lack of reading and writing in English, limited knowledge of technology and shared usage of mobile phones are customer perspective barriers in m-banking adoption. Cognitive barriers identified in this research are rural SMEs' lack of awareness of banking benefits, conceptual understanding of banking using a mobile phone, trust and security concerns over m-banking. The design characteristics of mobile technology such as the small keyboard and screen of the mobile phone, and slow internet on the mobile phone are also some barriers to the rural SME owners. Operational obstacles of m-banking are stakeholders' management and m-banking agent management. Lack of banks' and MTOs' effective leadership and limited vision on m-banking, MTOs reluctance to make partnerships with new banks, m-banking providers' competencies and security could be barriers in m-banking adoption in Bangladesh. This research also suggests that fees can be a barrier in m-banking diffusion to some of the rural SME owners. Finally, informal

banking systems and illegal money transfers are also obstacles m-development in Bangladesh.

7.2.5 Answer to R. Q 5: What are the stakeholders' recommendations in m-banking adoption for rural SMEs in Bangladesh?

This research provides stakeholders' recommendations for m-banking development. The recommendations are for a business version of m-banking for SMEs, for government's intervention in the m-banking project, policy and regulation development by the banks and m-banking system improvements. This research stresses that the government should come forward in the promotion of m-banking, educating the pay point agents, and awareness development of the SME on m-banking. Government should actively conduct competency checks on m-banking providers before granting the m-banking provider a licence to operate. As small banks are finding it hard to make partnerships with the MTOs, this research recommends establishing policy regarding the m-banking partnership between the banks and MTOs. Other recommendations are quick dispute regulation policy and an SMS price policy for m-banking providers.

This research also shows the need for an enhanced quality of m-banking systems and interoperability among different m-banking networks. Lastly, as m-banking is new in Bangladesh, the research participants recommended joint research and knowledge sharing on the target market, policy development and m-banking system management.

7.3 The m-banking framework

This research presents a framework for m-banking adoption for rural SMEs in Bangladesh. The factors of the framework are refined and confirmed empirically by quantitative and qualitative research methodology.

Figure 7.1: A framework for providing m-banking to rural SMEs in Bangladesh



Advantages for rural SMEs

- Availability of bank accounts for rural SMEs
- Opportunity to apply for an SME loan
- Time saving inter-bank transfers
- Easy money transfers to city based suppliers
- Convenient salary transfers for employees
- Opportunity to link to the global economy
- Speedier business through fast transactions
- Opportunity to expand business
- Better control of SME finances
- Improved security of money
- Increased literacy of owners/managers
- Facilitates IT adoption
- Increases savings attitude of owners



Advantages for Banks

- Generates profits besides core banking
- Increases bank's deposits
- Increases rural customer base
- Improves customer services of the banks
- Better management of the banks
- Increases bankers' productivity
- Decreased operating costs for the banks
- Increased brand image
- Creates employment for banks
- Improved rural-urban SME business
- SMEs shift from the informal to the formal banking system.

Barriers and concerns

- SME owners'/managers' inability to use the internet
- Lack of reading and writing skills in English
- Owners'/managers' limited technological competencies
- Lack of awareness of banking benefits
- Cognitive barriers such as trust and safety concerns
- Small keyboard, screen & slow internet on mobile phones
- Problem in managing too many stakeholders and agents
- Lack of banks' and MTOs' effective leadership
- MTOs' reluctance to make partnerships with small banks
- M-banking providers' competencies
- Lack of security in rural areas creates difficulty for banks in m-banking cash management
- High service fees and service charges for m-banking
- Competition from informal banking systems



Recommendations

- Business version m-banking for SMEs
- Instant ability to cash m-banking money
- Real time inter-bank transactions
- International (or at least Southeast Asian) m-banking platform
- Joint promotion by the banks, MTOs and government
- Government support in educating pay point agents
- Banks and MTOs m-banking capabilities checking
- Awareness development among SMEs
- Policy for partnership between banks and MTOs
- Improved legislation to protect customers to resolve m-banking disputes
- SMS price policy for m-banking
- M-banking system improvements and increased features
- Interoperability in m-banking
- Research and knowledge sharing



Advantages for MTOs

- Generates profits besides voice communication service
- Decreases SIM drop ratio rate
- Increases customer loyalty
- Increases brand image



Advantages for Country

- Creates employment in rural areas of m-banking agents
- Improves rural-urban business
- Assists government in removing the illegal banking system.

Customer Perspective Factors

Banking satisfaction

Gender

Education

Perceived credibility



SME Type and Category

M-banking Cost

Organizational Factors

- Bank's engagement with SME clients
- IT competency of the m-banking providers
- Top management support
- M-banking project within the organizational objectives
- SMEs' sophisticated level of literacy
- Rural SMEs unfavourable support from traditional banks
- High availability of mobile technology experts
- Increasing literacy among new generations SMEs

Country Level Factors

Policy

- Central bank's initiatives to offer banking to the unbanked
- Central bank's quick m-banking policy development
- Government's initiatives to support m-banking

Culture

- Public's willingness and acceptance of mobile phone based information systems

Technology

- Huge mobile phone adoption
- Existing mobile technology infrastructure

Environment

- Lack of banking provision for rural SMEs
- Bank closures and inconvenient banking due to political instability

7.4 Practical and theoretical values

The framework offers the following practical and theoretical values:

- Since banking is one of the main obstacles to the SMEs in Bangladesh and other developing countries, this research provides answers as to how SME banking can be improved by m-banking.
- This research is being undertaken at the right time as m-banking is of national interest in Bangladesh. This research contributes greatly to the national concern in Bangladesh of how to make full use of m-banking for the unbanked individuals and SMEs.
- The research is expected to support the national policies undertaken in Bangladesh, such as Millennium Development Goals 2015 and the National IT Policy 2009.
- Following the findings of this research, developing countries which have similar socioeconomic conditions may also receive useful knowledge from this study when developing m-banking for the rural unbanked population. Especially, when developing m-banking for SMEs in developing countries those share similar economical, technical and social issues, can share the knowledge gained from this thesis.
- The findings of this research can assist banks to redefine their banking business model regarding remote customers.
- The findings from this research should help the banks to plan their strategies in reaching remote customers and in accelerating m-banking development. Bank management may require information about what macro-level factors impact on the m-banking adoption for rural SMEs. This research can help the bank managers to identify factors and determinants that influence the adoption of m-banking.
- The research can assist m-banking policy makers such as the government and the Central Bank in introducing and formulating better m-banking policy.

- The outcomes of this research will be of potential value in increasing m-banking awareness in Bangladesh, especially among the SME owners and managers.
- This study contributes significantly to the theoretical understanding of m-banking through a development of a framework for rural SMEs in Bangladesh, which is a major contribution of this research is to the existing knowledge of m-banking. The deeper understanding of m-banking is increased by providing both micro and macro-level adoption factors as well as inhibitors in general and in particular in Bangladesh. Within the current research efforts on m-banking, this research is one of the few works that collected data not only from the consumers, but also from other important stakeholders of m-banking, such as banks, MTOs and m-banking experts. Using mixed method research this study explores organizational and country level factors that impact m-banking adoption in Bangladesh. Lastly, this paper identifies some new factors, both from the customer perspective and from the macro-level perspectives, which have been rarely identified in prior IS (Information system) literature.

7.5 Limitations of this research

- Most of the SME owners and managers had not used m-banking before, since m-banking has not been implemented when the research was conducted. The lack of previous knowledge on m-banking of the survey participants is the main limitation in the study.
- The views came only from the banks and MTOs that offer m-banking. It would be preferable to conduct interviews with banks who do not offer m-banking. However, these banks did not respond to my request to interview them.
- The research only considered consumer perspective, organisational and country-level factors in m-banking adoption. However, this research does not claim that the factors identified in this research are the only determinants in m-banking adoption.

7.6 Future Research Directions

The study of m-banking adoption within Bangladeshi SMEs has provided some basis for future research. These are as below:

- Firstly, the m-banking framework needs to be tested in Bangladesh. The researcher will approach the participant banks to test the framework's effectiveness.
- Future research should collect data from banks which are not currently offering m-banking to the consumer. This will enable us to understand more on m-banking adoption.
- Future research also should include technological factors of the users in the m-banking framework.
- Lastly, future research could extend m-banking studies to the city-based SMEs or to the SMEs located closer to the capital to throw some interesting insight of m-banking.

7.7 Conclusion

The merit of the research lies in presenting, for the first time, an m-banking framework for rural Bangladesh that includes customer perspective factors and macro-level m-banking factors. Moreover, for the first time, this research considers m-banking adoption in the SMEs, who provide the second source of income in the country. The privileged position of the rural SME owners/managers use of mobile phones is a great opportunity for offering m-banking to the rural SMEs. Therefore, the research findings of this study not only address the call by the government and banks for adopting m-banking for the rural SMEs in Bangladesh but also enhance our understanding of m-banking factors. Collectively, these findings illustrate the potential role of m-banking, particularly for the rural SMEs. It has important implications in providing useful insights into human behavioural and motivational factors that affect attitudes towards

the adoption of m-banking in developing countries. Compared to other m-banking acceptance research, this research is based on larger numbers of participants and findings are from controlled face-to-face survey and interviews. Furthermore, the study sets a starting point for future research to further explore the effect of macro-level factors in m-banking adoption. The contribution is significant, a step forward in m-banking research in Bangladesh.

References

- Ahad, M. T., Dyson, L. E. & Gay, V. 2012, 'An Empirical Study of Factors Influencing the SME's Intention to Adopt m-Banking in Rural Bangladesh', *Journal of Mobile Technologies, Knowledge & Society*, vol. 2012.
- Ahmad, F. 2005, 'Financial sector reform in Bangladesh: developments and challenges', *The New Nation*, March 2.
- Ahmad, S., & Khanal, D. R. 2007, 'Services trade in developing Asia: a case study of the banking and insurance sector in Bangladesh', *Asia-Pacific Research and Training Network on Trade*.
- Ahmed, K., & Chowdhury, T. A. 2009, 'Performance Evaluation of SMEs of Bangladesh', *International Journal of Business and Management*, vol. 4, no. 7.
- Ahmed. S.M. S., Rayhan S. J. and Islam M. A. 2011, 'Problems and prospects of mobile banking in Bangladesh', *Journal of Information Engineering and Applications*, 1, 6.
- Ahsan, A.H.M.K. 2005, 'Role of NGO's Micro-credit Programme in Poverty Reduction in Bangladesh: A study on Some Selected NGOs', *Pakistan Journal of Social Sciences*, vol.3, issue, 8, pp. 1053-1059
- Ajzen, I. & Fishbein, M. 1969, 'The prediction of behavioral intentions in a choice situation', *Journal of Experimental Social Psychology*, 5(4), 1969, 400-416.
- Aker, J., & Mbiti, I. 2010, 'Mobile phones and economic development in Africa'. *Center for Global Development Working Paper*, (211).
- Alam, M., S. & Ullah, M., A. 2006, 'SMEs in Bangladesh and Their Financing: An Analysis and Some Recommendations', *The Cost and Management*, vol. 34, no. 3, pp. 57-72.
- Alam, S. B., Kabir, H. M. D., Sakib, M. N., Sazzad, A. R., Shahnaz, C., & Fattah, S. A. 2010, 'A secured electronic transaction scheme for mobile banking in Bangladesh incorporating digital watermarking', *Information Theory and Information Security (ICITIS)*, 2010 IEEE International Conference on (pp. 98-102). IEEE.
- Alam, S. S., Khatibi, A., Santhapparaj, A. S., & Talha, M. 2007, 'Development and prospects of internet banking in Bangladesh', *Competitiveness Review: An International Business Journal Incorporating Journal of Global Competitiveness*, 17(1/2), 56-66.
- Ali, M. M., Ahmed, R., Rahman, A., Azam, M.M. 2007, 'Electronic Banking in Bangladesh: Potential and Constraints', *Journal of marketing*, Dhaka University vol. no 10.

- Amin, H. 2011, 'SMS banking: are there discrepancies between Muslim and non-Muslim Bank customers?' *Social Science Research Network*, Working Paper Series.
- Amin, H., Hamid, M.R., Lada, S. & Anis, Z. 2008, 'The adoption of mobile banking in Malaysia: The case of Bank Islam Malaysia Berhad (BIMB)', *International Journal of Business and Society*, vol. 9, no. 2, pp. 43-53.
- Anderson, J. 2010, 'M-banking in developing markets: competitive and regulatory implications,' *The journal of policy, regulation and strategy for telecommunications*, vol. 12, no. 1, pp 18-25.
- Anus, S., Qureshi, F. A., Malik, S., Abbasi, A., Chaudhry, A. & Mirza, S.N. 2011, 'Trust and initial acceptance of Mobile Banking in Pakistan', *International Journal of Scientific & Engineering Research*, 2, 8.
- Ardic, O. P., Mylenko, N., & Saltane, V. 2012, 'Access to Finance by Small and Medium Enterprises: a Cross-Country Analysis with A New Data Set', *Pacific Economic Review*, 17(4), 491-513.
- Asian Development Bank, 2013.
- Awa, H. O., Nwibere, B. M., & Inyang, B. J. 2010, 'The uptake of electronic commerce by SMEs: a meta theoretical framework expanding the determining constructs of TAM and TOE frameworks' *Journal of Global Business and Technology*, 6(1), 1-27.
- Bångens, L. & Söderberg, B. 2011, 'Mobile Money Transfer and Usage Among Micro-and Small Businesses in Tanzania,' SPIDER, *The Swedish Program for Information and Communication Technology in Developing Regions*.
- Bangladesh Banks, 2013, 'Annual Report 2012-2013', viewed 31 August 2013, Available at: www.bangladesh-bank.org/.
- Bangladesh Bureau of Statistics, 2012, GDP of Bangladesh 2012, Bangladesh Bureau of Statistics. Dhaka, viewed 31 August 2013, http://www.bbs.gov.bd/na_wing/gdp_08.pdf.
- Bangladesh Telecommunications Company Limited. 2013, 'Mobile Phone Subscribers in Bangladesh', Viewed 31st November 2013, <http://www.bttb.net/>.
- Bankole, O. & Cloete, E. 2011, 'Mobile banking: A comparative study of South Africa and Nigeria', *AFRICON*, 1, 6.
- Barnes, S.J. & Corbitt, B. 2003, 'Mobile banking: concept and potential,' *International Journal of Mobile Communications*, vol. 1, no. 3, pp 273-288.
- Baten, M. A., & Kamil, A. A. 2010, E-banking of economical prospects in Bangladesh. *Journal of Internet Banking and Commerce*, 15(2), 1-10.

- Beck, T. & Demirgüç-Kunt, A. 2006, 'Small and Medium-Size Enterprises: Access to Finance as a Growth Constraint' *Journal of Banking and Finance*, vol. 30, pp. 2931–2943.
- Beck, T., Demirgüç-Kunt, A., Laeven, L., & Maksimovic, V. 2006, 'The Determinants of Financing Obstacles', *Journal of International Money and Finance*, vol. 25, pp. 932-952.
- Berry, A., Rodriguez, E., & Sandee, H. 2001, 'Small and Medium Enterprise Dynamics in Indonesia', *Indonesian Economic Studies*, vol. 37, no. 3, pp. 363–384.
- Bhattacharya D. & Chowdhury, T.A. 2003, 'Financial Sector Reforms in Bangladesh: The Next Round,' *Occasional Paper 22, Dhaka: Centre for Policy Dialogue*.
- Bhuiyan, A. J. M. S. A. 2004, 'Universal Access in Developing Countries: A Particular Focus on Bangladesh', *The Information Society*, 20(4): 269-278.
- Brannen, J. 1992, 'Combining Qualitative and Quantitative Approaches: An Overview', in J. Brannen (ed.) *Mixing Methods: Qualitative and Quantitative Research*, pp. 3–37. Aldershot: Avebury
- Brown, I., Cajee, Z., Davies, D and Stroebe, S, 2003, 'Cell phone banking: predictors of adoption in South Africa—an exploratory study', *International Journal of Information Management*, vol. 23, Issue 5, October 2003, Pages 381-394
- Carroll, J., Howard, S., Peck, J., & Murphy, J. 2007, 'From adoption to use: the process of appropriating a mobile phone', *Australasian Journal of Information Systems*, 10(2).
- Chan, S. S., Fang, X., Brzezinski, J. R., Zhou, Y., Xu, S., & Lam, J. (2002). Usability for Mobile Commerce Across Multiple Form Factors. *J. Electron. Commerce Res.*, 3(3), 187-199.
- Chavan, A. L., Arora, S., Kumar, A., & Koppula, P. 2009, 'How Mobile Money Can Drive Financial Inclusion for Women at the Bottom of the Pyramid (BOP) in Indian Urban Centers', *Internationalization, Design and Global Development*, 475-484.
- Chemingui, H. 2013, 'Resistance, Motivations, Trust and Intention to use Mobile Financial Services', *International Journal of Bank Marketing*, 31(7), 5-5.
- Chipchase, J., & Tulusan, I. 2007, 'Shared phone use'.
- Chong, J. L., Chong, A. Y. L., Ooi, K. B., & Lin, B. 2011, 'An empirical analysis of the adoption of m-learning in Malaysia', *International Journal of Mobile Communications*, 9(1), 1-18.

- Chowdhury A. 2001, 'The Impact of Financial Reform on Private Savings in Bangladesh', *World Institute for Development Economics Research, Discussion Paper 2001/78*, Helsinki.
- Chowdhury, J. R. 1999, 'Information Technology in Bangladesh', *A paper on IT policy in Bangladesh*, April 1999.
http://www.bdix.net/sdnbd_org/world_env_day/2002/current_issues/IT/it-bangladesh-jrc.pdf
- Chowdhury, M. S. 2007, 'Overcoming Entrepreneurship Development Constraints: the Case of Bangladesh', *Journal of Enterprising Communities: People and Places in the Global Economy*, vol. 1 no. 3, 2007 pp. 240-251.
- Chu, S., & Yao-bin, L. 2009, 'Effect of Online-to-Mobile Trust Transfer and Previous Satisfaction on the Foundation of Mobile Banking Initial Trust,' *8th International Conference on Mobile Business*, pp. 1-6.
- Chung, N., Kwon, S. J. 2008, 'Effect of trust on mobile banking satisfaction: a multi-group analysis of information system success instruments', *Behaviour & Information Technology*, vol. 28, no. 6, pp. 549-562.
- Crabbe, M., Standing, C., Standing, S., & Karjaluoto, H. 2009, 'An adoption model for mobile banking in Ghana,' *International Journal of Mobile Communications*, vol. 7, no. 5, pp 515-543.
- Cracknel, D. 2004, 'Electronic banking for the poor – panacea, Potential and pitfalls' *Small enterprise development*, vol. 15, no. 4.
- Creswell, J.W. 2003, 'Research design: Qualitative, quantitative, and mixed approaches', *Thousand Oaks*, CA: Sage.
- Cruz, P., Laukkanen, T., & Muñoz, P. 2011, 'Exploring the factors behind the resistance to mobile banking in Portugal', *Developing Technologies in E-Services, Self-Services, and Mobile Communication: New Concepts*, 200.
- Cull, R., Davis, L.E., Lamoreaux, N. R., Rosenthal, J. 2004, 'Historical financing of small and medium size enterprises', *World Bank Policy Research Working Paper no. 2334*.
- Dahlberg, T., Mallat, N., Ondrus, J., Zmijewska, A. 2008, Past, Present and Future of mobile payments research: A literature Review', *Electronic Commerce Research and Applications*, vol.7, pp.165-181
- Daniel, E. 1999, 'Provision of electronic banking in the UK and the Republic of Ireland', *The International Journal of Bank Marketing*, vol. 17, Iss. 2, pp 72

- Daud, N. M., Kassim, N. E. M., Said, W. S. R. W. M., & Noor, M. M. M. 2011, 'Determining Critical Success Factors of Mobile Banking Adoption in Malaysia,' *Australian Journal of Basic and Applied Sciences*, 5, 9, 252-265.
- Davis, B., Winters, P., Carletto, G., Covarrubias, K., Quinones, E., Zezza, A., Stamoulis, K., Azzarri, C., DiGiuseppe, S. 2010, 'A cross-country comparison of rural income generating activities,' *World Development*, 38 (1), 48–63.
- Davis, F. D. (1989), 'Perceived usefulness, perceived ease of use, and user acceptance of information technology,' *MIS Quarterly*, 13(3), 318–339.
- Deb, S. K., Harun, M. A., & Bhuiyan, M. R. U. 2011, 'The Dimensions Affecting the Adoption of Mobile Banking in Bangladesh', *Department of Banking Faculty of Business Studies University of Dhaka*, 1997.
- Delone, W.H. & McLean, E.R. 1992, 'Information systems success: the quest for the dependent variable', *Information Systems Research*, vol. 3, no. 1, pp. 60–95.
- Delone, W.H. & McLean, E.R. 2003, 'The DeLone and McLean model of information systems success: a ten-year update', *Journal of Management Information*
- Dewan, S. M. & Dewan, A. M. 2009, 'Young Consumers' M-banking Choice in Urban Bangladesh: Preliminary Indication,' *Computers and Information Technology*, 121-126
- Dewan, S. M. 2010, 'Past, Present and Future of M-Banking Research: A Literature Review', *Proceedings of ACIS 2010*.
- Dewan, S. M., & Dewan, A. M. 2010, 'Modelling Choice of Mobile Technology for M-Banking', *Proceedings of the 2010 International Conference on Industrial Engineering and Operations Management*, Dhaka, Bangladesh, January 9 – 10, 2010
- Dewan, S.M., Low, G., Land, L., and Dewan, A.M. 2009, 'Consumer Choice Model of Mobile Banking,' *Australasian Conference on Information Systems*, 2009.
- Dholakia, N., & Kshetri, N. 2005, 'Mobile commerce as a solution to the global digital divide: Selected cases of e-development', Available at SSRN 847184.
- Dolan, J. 2009, 'Accelerating the Development of Mobile Money Ecosystems' *Proceeding of Mobile Money Summit 2009*.
- Donner, J. 2008, 'Research Approaches to Mobile Use in the Developing world: A review of the literature,' *The Information Society*, 24, 140-159.
- Duncombe, R., & Boateng, R. 2009, 'Mobile Phones and Financial Services in Developing Countries: a review of concepts, methods, issues, evidence and future research directions', *Third World Quarterly*, 30(7), 1237-1258.

- Eusuf, M. A., Toufique, M. K., & Shamannay, U. 2007, 'Trade, Development and Poverty Linkage: A Case Study of Cellular Phone in Bangladesh', *Unnayan Shamannay*.
- Frempong, G. 2009, 'Mobile telephone opportunities: the case of micro-and small enterprises in Ghana', *info*, 11(2), 79-94.
- Goodhue, D. L. & Thompson, R. L. 1995, 'Task technology fit and individual performance', *MIS Quart*, 19(2) 213-236.
- Guba, E. G., & Lincoln, Y. S. 1994, 'Competing paradigms in qualitative research', In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 105-117). *Thousand Oaks, CA: Sage*.
- Harvie, C. 2004, 'East Asian SME Capacity Building, Competitiveness and Market Opportunities in a Global Economy', *Working Paper 04-16*, Department of Economics, University of Wollongong.
- Hasan, A. H. M. S., Baten, M. A., Kamil, A. A., & Parveen, S. 2010, 'Adoption of ebanking in Bangladesh: An exploratory study', *African Journal of Business management*, 4(13), 2718-2727.
- Hashemi, S. M., Schuler, S. R., & Riley, A. P. 1996, 'Rural Credit Programs and Women's Empowerment in Bangladesh', *World Development*, vol. 24, no. 4, pp.635-653.
- Hassan, M. K., Ihsan Isik, I., & Mamun, A. 2010, 'Trade liberalization and industry performance in Bangladesh', *Journal of Policy Modelling*, vol. 32, pp. 399-417.
- Higgins, D., Kendall, J., & Lyon, B. 2012, 'Mobile Money Usage Patterns of Kenyan Small and Medium Enterprises', *Innovations*, 7(2), 67-81.
- Hong, S.J., Thong, J.Y.L., Moon, J.Y., and Tam, K.Y. 2008, 'Understanding the behavior of mobile data services consumers,' *Information Systems Frontiers* (10:4), pp 431-445.
- Hosmer Jr, D. W., Stanley, L. and Rodney X. S., 2013 'Applied logistic regression'. John Wiley & Sons.
- Hossain, N. 1998, 'Constraints to SME Development in Bangladesh', *Seminar Proceedings*, University of Maryland at College Park, USA.
- Islam, A., Rahman, A. 2006, 'Growth and Development of Information and Communication Technologies In Bangladesh', *The Electronic Library*, vol. 24, ANo.2, pp.135-146.
- Ivatury, G., & Mas, I. 2008, 'The early experience with branchless banking', *Focus Note*, 46.

- Jenkins, B. 2008, 'Developing Mobile Money Ecosystems', Washington, DC: IFC and the Harvard Kennedy School.
- Jia-bao, L. 2011, 'Research on consumer trust and satisfaction in mobile commerce,' *International Conference on Management Science and Engineering (ICMSE)*, 47-51.
- Jinnah, M. A., 2011, 'ICT in vocational teaching/learning and research in Southeast Asian Countries: A case of Bangladesh.' *International Journal of Vocational and Technical Education* 3.2.
- Johnson, R. B., & Onwuegbuzie, A. J. 2004, 'Mixed methods research: A research paradigm whose time has come', *Educational Researcher*, vol. 33, no. 7, pp.14-20.
- Kadušić, E., Bojović, P. and Žgalj, A. 2011, 'Consumer Adoption-Risk Factor of Mobile Banking Services', *World Academy of Science, Engineering and Technology*, 80.
- Kang, H., Lee, M. J., & Lee, J. K. 2012, 'Are You Still with Us? A Study of the Post-Adoption Determinants of Sustained Use of Mobile-Banking Services', *Journal of Organizational Computing and Electronic Commerce*, 22(2), 132-159.
- Kaplan, B., & Maxwell, Jo A. 'Qualitative Research Methods for Evaluating Computer Information Systems,' in *Evaluating Health Care Information Systems: Methods and Applications*, J. G. Anderson, C. E. Aydin, and S. J. Jay (eds.), Sage, Thousand Oaks, CA, 1994, pp. 45-68.
- Khalil, M. I, Ahmed, I., Khan, M. D, 2010, 'Internet Banking: Development and Prospects in Bangladesh', *Proceedings of Dhaka Conference*, January Dhaka, Bangladesh.
- Khan, J. H., Nazmul, A. K., Hossain, M. F., & Rahmatullah, M. 2012, ' Perception of SME Growth Constraints in Bangladesh: An Empirical Examination from Institutional Perspective', *European Journal of Business and Management*, 4(7), 256-272.
- Khan, M. S. & Barua, S. 2009, 'The Status and Threats of Information Security in the Banking Sector of Bangladesh: Policies Required', *Bangladesh Journal of MIS*, vol.1, no.2.
- Khanam, D., Ahmed, M., & Khan, S.H. 2005, 'E-Banking: An Emerging Issue of Developing Country Like Bangladesh, Pakistan', *Journal of Social Science*, Vol. 3, Issue 3, pp 526-259.
- Kim, G., Shin, B.S., and Lee, H.G. 'Understanding dynamics between initial trust and usage intentions of mobile banking,' *Information Systems Journal* (19:3) 2009, pp 283-311.

- Kirui, O. K., Okello, J. J., & Nyikal, R. A. 2010, 'Awareness and use of m-banking services in agriculture: The case of smallholder farmers in Kenya', *In 2010 AAAE Third Conference/AEASA 48th Conference* (pp. 19-23).
- Kirui, O. K., Okello, J. J., & Nyikal, R. A. 2012, 'Impact of Mobile Phone-based Money Transfer Services in Agriculture: Evidence from Kenya', *In 2012 Conference*, August 18-24, 2012, Foz do Iguacu, Brazil (No. 125738). International Association of Agricultural Economists.
- Kleijnen, M., Wetzels, M., and De Ruyter, K. 2004, 'Consumer acceptance of wireless finance,' *Journal of Financial Services Marketing* (8:3), 03 2004, pp 206-217.
- Klein, M., Mayer, C. 2011 'Mobile banking and financial inclusion: The regulatory lessons', *Working paper series Frankfurt School of Finance & Management*, No. 166.
- Kothari, C. R. 2003, 'Research methodology, methods and techniques', *Wisha Prakashan*, New Delhi.
- Kuisma, T., Laukkanen, T., & Hiltunen, M. 2007, 'Mapping the reasons for resistance to Internet banking: A means-end approach', *International Journal of Information Management*, 27(2), 75-85.
- Kumar, D., Martin, D., & O'Neill, J. 2011, 'The times they are a-changin': mobile payments in India', *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 1413-1422). ACM.
- Kurnia, S., Mahbubur, R., Husada, R., & Alhashmi, S. M. 2013, 'Identifying Facilitators and Challenges for IT Adoption at a Local Malaysian Retail Company', *The IT Management Perspective*.
- Lau, X., Li, H., Zhang, J., and Shim, J.P. 2010, 'Examining multi-dimensional trust and multi-faceted risk in initial acceptance of emerging technologies: an empirical study of mobile banking services', *Decision Support systems*, vol.49, pp.222-234.
- Laukkanen, T. & Cruz, P. 2012, 'Cultural, Individual and Device-Specific Antecedents on Mobile Banking Adoption: A Cross-National Study,' *System Science (HICSS)*, 2012 45th Hawaii International Conference on , vol., no., pp.3170-3179, 4-7 Jan. 2012.
- Laukkanen, T. & Pasanen, M. 2005, 'Characterising The Users Of Mobile Banking: A Distinct Group Of Online Customers?' *ANZMAC 2005 Conference: Electronic Marketing*, vol. 35, Issue. 5, pp.393-412.
- Laukkanen, T. 2008, 'Determinants of mobile banking resistance: A preliminary model', *ANZMAC (Australian and New Zealand Marketing Academy) Conference Proceedings*, Sydney, Australia, December 1-3, 2008.

- Laukkanen, T. & Cruz, P. 2012, 'Cultural, Individual and Device-Specific Antecedents on Mobile Banking Adoption: A Cross-National Study', *45th International Conference on System Science (HICSS)*, Hawaii, 3170-3179.
- Laukkanen, T., & Kiviniemi, V. 2010, 'The role of information in mobile banking resistance', *International Journal of Bank Marketing*, 28(5), 372-388.
- Laukkanen, T., & Lauronen, J. 20005, 'Consumer value creation in mobile banking services,' *International journal of mobile Communications (3:4) 2005*, pp 325-338.
- Laukkanen, T., Sinkkonen, S., Kivijarvi, M., and Laukkanen, P. 2007, 'Innovation resistance among mature consumers,' *Journal of Consumer Marketing (24:7) 2007*, pp 419-427.
- Laukkanen, T., Sinkkonen, S., Laukkanen, P., & Kivijarvi, M. 2008, 'Segmenting bank customers by resistance to mobile banking', *International Journal of Mobile Communications*, 6(3), 309-320.
- Lee, C.P., Mattila, M., and Shim, J.P. 2007, 'An Exploratory Study of Information Systems Resistance: The Case of Mobile Banking Systems in Korea and Finland,' *Americas Conference on Information Systems*, p. 448.
- Lee, K.C., and Chung, N. 2009, 'Understanding factors affecting trust in and satisfaction with mobile banking in Korea: A modified DeLone and McLean's model perspective,' *Interacting with Computers*.
- Leedy, P. & Ormrod, J. 2000, 'Practical Research: Planning & Design', *Prentice Hall (7th ed)*.
- Levy, B., 1993, 'Obstacles to developing indigenous small and medium enterprises: an empirical Assessment', *The World Bank Economic Review* 7 (1), 65-83.
- Liou, D. 2008, 'Four Scenario Analysis for mobile Banking Development Contextualized to Taiwan', *PICMET 2008 Proceedings*, Cape town South Africa, pp.27-31.
- Liu, Z., Min, Q., Ji, S. 2009, 'An empirical study on mobile banking adoption: the role of trust', *International symposium on Electronic Commerce and Security*, pp.7-13.
- Luarn, P., and Lin, H.H. 'Toward an understanding of the behavioral intention to use mobile banking,' *Computers in Human Behavior (21:6)*, Nov 2005, pp 873-891.
- Luo, X., Lee, C. P., Mattila, M., & Liu, L. 2012, 'An exploratory study of mobile banking services resistance', *International Journal of Mobile Communications*, 10(4), 366-385.

- Luo, X., Li, H., Zhang, J., and Shim, J. 2010, 'Multi-dimensional trust and multi-faceted risk in initial acceptance of emerging technologies: An empirical study of mobile banking,' *Decision Support Systems* (49) 2010.
- Mackenzie, N., & Knipe, S. 2006, 'Research dilemmas: Paradigms, methods and methodology', *Issues in educational research*, 16(2), 193-205.
- Mahmuda, I., Baskaran, A., & Pancholi, J. 2010, 'Financing Social Innovation: The Case of Micro Financing of BRAC's CFPR Programme in Bangladesh', 8th *International Conference Making innovation Work for Society*, Kuala Lumpur, Malaysia, 2010.
- Mallat, N., Rossi, M. & Tuunainen, V. 2004, 'Mobile banking Services,' *Communications of the ACM*, vol. 47, no. 5, pp 42-46.
- Mansfield, I. 2011, 'Mobile Banking Surges As Emerging Markets Embrace Mobile Finance', <http://www.cellular-news.com/story/49148.php>.
- Mas I. & Ng'weno, A. 2009, 'Three keys to M-PESA's success: Branding, channel
- Mas, I., & Klein, M. 2012, 'A note on macro-financial implications of mobile money schemes (No. 188)', *Working Paper Series, Frankfurt School of Finance & Management*.
- Mas, I., & Ng'weno, A. 2012, 'Why Doesn't Every Kenyan Business Have a Mobile Money Account?', *FSD Insights*, (4).
- Mazumdar, D. 1991, 'Import-Substituting Industrialization and Protection of the Small-Scale', *World Development*, vol. 19, no. 9, pp. 1197-1213.
- Mbiti, I., & Weil, D. N. 2011, 'Mobile banking: The impact of M-Pesa in Kenya', *National Bureau of Economic Research*.
- Medhi, I., Medhi, I., Nagasena, G. S. N., & Toyama, K. A. 2009,, G. S. N., and Toyama, K. A. 2009, 'Comparison of Mobile Money-Transfer UIs for Non-Literate and Semi-Literate Users', *Proceedings of ACM Conference on Computer Human Interaction, Boston, USA*.
- Medhi, I., Ratan, A., & Toyama, K. 2009, 'Mobile-Banking Adoption and Usage by Low-Literate, Low-Income Users in the Developing World', *Human Computer International (HCII)*, San Diego.
- Min, S., Fei, C. 2009, 'Research of Mobile Banking Service in China: A Cross Rode of Communication Technology and Financial Innovation', *E-Business and Information System Security*, pp 1 - 5

- Min, S., Lu, W. & Yinjun, Y. 2011, 'An Empirical Model of Individual Mobile Banking Acceptance in China,' *International Conference on Computational and Information Sciences (ICCIS)*, 21-23 Oct. 2011.
- Mingers, J. 2001, 'Combining IS Research Methods: Towards a Pluralist Methodology,' *Information Systems Research* (12:3) 2001, pp. 240-259.
- Mintoo, A. A. 2006, 'SMEs in Bangladesh', *CACCI Journal*,
<http://www.cacci.org.tw/Journal/2006%20Vol%201/SMEs%20in%20Bangladesh.pdf>.
- Moazzem, K., G. 2008, 'Strategies for Entrepreneurship Development in Bangladesh: Unleashing the Potentials of SMEs', *Centre for Policy Dialogue*,
(http://www.gtdforum.org/files/15-09-08-11-36-39_080912%20Policy%20brief%20Entrepreneurship%20in%20Bangladesh.pdf).
- Morawczynski, O. 2008, 'Surviving in the Dual System: How M-Pesa is Fostering Urban-to-Rural Remittances in a Kenyan Slum', *HCC8 Conference proceedings*, Pretoria.
- Morawczynski, O. 2011, 'Examining the adoption, usage and outcomes of mobile money services: the case of M-PESA in Kenya'.
- Morawczynski, O., & Pickens, M. 2009, 'Poor people using mobile financial services: observations on customer usage and impact from M-PESA.
- Mottaleb, K. A., and Tetsushi, S., 2013, 'The Development Process of Rural Informal Industries in Developing Countries: The Case of Bangladesh' *The Journal of Developing Areas* 47.2., PP., 229-249.
- Mousumi F. & Jamil. S. 2010, 'Push Pull Services Offering SMS Based m-Banking System in Context of Bangladesh,' *International Arab Journal of e-Technology*, 1, 3, 79.
- Ndiwalana, A., Morawczynski, O., & Popov, O. 2010, 'Mobile Money Use in Uganda: A Preliminary Study', *M4D 2010*, 121.
- Neuman, W.L. 2003, *Social Research Methods: Quantitative and Qualitative Approaches*, (5th Ed.), *Pearson education*.
- Nichter, S. & Goldmark, L. 2009, 'Small Firm Growth in Developing Countries', *World Development*, vol. 37, no. 9, pp.1453-1464.
- Nupur, J. M. 2010, 'E-banking and customers' satisfaction in Bangladesh: An analysis', *International Review of Business Research Papers*, 6(4), 145-156.

- Oliveira, T., & Martins, M. F. 2010, 'Understanding e-business adoption across industries in European countries', *Industrial Management & Data Systems*, 110(9), 1337-1354.
- Orlikowski, W. J., & Baroudi, J.J., 1991, 'Studying Information Technology in Organisations: Research Approaches and Assumptions', *Information Systems Research*, 2:1.
- Pedersen, P. E., & Ling, R. 2003, 'Modifying adoption research for mobile Internet service adoption: Cross-disciplinary interactions in System Sciences', *Proceedings of the 36th Annual Hawaii International Conference on (pp. 10-pp)*.
- Peevers, G., Douglas, G., Marshall, D. & Jack, M. 2011, 'On the role of SMS for transaction confirmation with IVR telephone banking,' *International Journal of Bank Marketing*, 29(3) 206 – 223
- Peng, C. Y. J., Lee, K. L., & Ingersoll, G. M. 2002, 'An introduction to logistic regression analysis and reporting,' *The Journal of Educational Research*, 96(1), 3-14.
- Pinsonneault, A., and Kraemer, K. L. (1993b) 'Survey Research Methodology in Management Information Systems: An Assessment,' *Journal of Management Information Systems* (10:2), 1993b, pp. 75-105.
- Porteous, D. 2006, 'The enabling environment for mobile banking in Africa', *Boston, DFID*.
- Porteous, D. 2007, 'Just how transformational is m-banking', *Commissioned by Finmark*.
- Porteous, D. 2009, 'Mobilizing Money through Enabling Regulation', *Innovations: Technology, Governance, Globalization*, 4 (1): 75–90.
- Pousttchi, K., Schiessler, M. & Wiedemann, D.G. 2009, 'Proposing a Comprehensive Framework for Analysis and Engineering of Mobile Payment Business Models', *Information Systems and e-Business Management*, vol. 7, Issue 3, pp. 363-93.
- Powell R.A., Single H.M. 1996, ' Focus groups', *International Journal of Quality in Health Care*, 8, 5 (1996), 499-504.
- Punithavathi, R., & Duraiswamy, K. 2011, 'Secured Authenticated Mobile Agent Based Mobile Banking System', *European Journal of Scientific Research*, Vol.57 No.3 (2011), pp.494-501.
- Rahman, A., Abdullah, M. N., & Tooheen, R. B. 2012, 'Mobile Money in Bangladesh', *Developing Country Studies*, 2(8), 60-67.

- Rahman, H. 2001, 'Internet in Bangladesh: millennium perspective', *Nepal IT Conference*, Jan 27 - 28, 2001, Kathmandu, Nepal.
- Rahman, K.M., Rummana, R. & Zinia, J. 2009, 'Making Mobile Phone Work for the Poor: A Socio-Economic Case Study', *Bangladesh Journal of Political Economy*. <http://bdeconassoc.org/userfiles/pdf/16%20socio%20economic%20impact%20mobile%20K%20M%20Rahman.pdf>.
- Rahman, M.M. 2009, 'E-Banking in Bangladesh: Some Policy Implications', *Bangladesh Bank Quarterly*, vol. VI, no. 3, Dhaka: Bangladesh Bank.
- Rahman, S. 2005, 'Orientations and motivation in English language learning: A study of Bangladeshi students at undergraduate level.' *Asian EFL Journal* 7.1. Ram, S., & Sheth, J. N. 1989, 'Consumer resistance to innovations: the marketing problem and its solutions', *Journal of Consumer Marketing*, 6(2), 5-14.
- Rangan, V. K., & Lee, K. 2012, 'Mobile Banking for the Unbanked', *Harvard Business School Marketing Unit Case*, (511-049).
- Ratten, V. 2011, 'Social Cognitive Theory in Mobile Banking Innovations,' *International Journal of E-Business Research (IJEER)*.
- Ratten, V. 2011, 'Mobile banking innovations and entrepreneurial adoption decisions', *International Journal of E-Entrepreneurship and Innovation (IJEEI)*, 2(2), 27-38.
- Reaz, M. and Arun, T. 2006, 'Corporate governance in developing economies: perspective from the banking sector in Bangladesh', *Journal of Banking Regulation*, vol. 7 no.1/2 pp. 94-105.
- Resnik, D. B. 2010, 'What is ethics in research & why is it important', *Research Triangle Park, North Carolina: National Institute of Environmental Health Sciences/National Institute of Health*.
- Riivari, J. 2005, 'Mobile banking: A powerful new Marketing and CRM tool for financial services companies all over the Europe', *Journal of Financial Services Marketing*, vol. 10, pp. 11-20.
- Riquelme, H. E. & Rios, R. E. 2010, 'The moderating effect of gender in the adoption of mobile banking', *International Journal of Bank Marketing*, Vol. 28 No. 5, 2010, pp. 328-341.
- Rogers, E. M. 1995, 'Diffusion of innovations', 4th edn, *The Free Press*, New York, NY.
- Sale, J., Lohfeld, L., & Brazil, K. 2002, 'Revisiting the quantitative-qualitative debate: Implications for mixed methods', *Quality & Quantity*, 36(1), 43-53

- Saleem, Z. & Rashid, K. 2011, 'Relationship between Customer Satisfaction and Mobile Banking Adoption in Pakistan', *International Journal of Trade, Economics and Finance*, 2(6), 537-544.
- Schendel, W. V. 2009, 'A history of Bangladesh' *Cambridge University Press*.
- Scornavacca, E., & Hoehle, H. 2006, 'Mobile Banking in Germany', *Proceedings of the Helsinki Mobility*
- Sechrest, L., & Sidana, S. 1995, 'Quantitative and qualitative methods: Is there an alternative?', *Evaluation and Program Planning*, 18, 77n87.
- Servon, L. J., & Kaestner, R. 2008, 'Consumer Financial Literacy and the Impact of Online Banking on the Financial Behavior of Lower-Income Bank Customers', *Journal of Consumer Affairs*, 42(2), 271-305.
- Shen, Y-C., Huang, C-Y, Chu, C-H., and Hsu, C-T. 2010, 'A benefit-cost perspective of the consumer adoption of the mobile banking system,' *Behaviour and Information Technology*, 29, 497-511.
- Siddiquee M. M., K. M. Z. Islam and M. I. Rahman (2006), 'Revisiting SME Financing in Bangladesh', *Journal of Business and Economics*, vol. 1, no. 1, July 2006, Daffodil International University.
- Silva, H., and Khan, A.S. 2004, 'Regulation and Investment: Case study of Bangladesh' *World Dialogue on Regulation for Network Economies*, viewed 31 August 2009, <http://www.regulateonline.org/content/view/224/31/>.
- Singh, H. K., & Tigga, A. E. 2012, 'Impact of information technology on Indian banking services', *Recent Advances in Information Technology (RAIT) 2012 1st International Conference* (pp. 662-665). IEEE.
- Strauss, A. & Corbin, J.M. 1998, 'Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory', *Sage Publications, Thousand Oaks, CA*.
- Sultana, R. 2009, 'Mobile banking: Overview of regulatory framework in emerging Markets', *4th Communication Policy Research, South Conference*, Negombo, Sri Lanka, Available at SSRN: http://ssrn.com/abstract_1554160.
- Suoranta, M. & Mattila, M. (2004) Mobile banking and consumer behavior: new insights into the diffusion pattern. *Journal of Financial Services Marketing*, 8, 354–366.
- Tambunan, T. 2009, 'Women entrepreneurship in Asian developing countries: Their development and main constraints', *Journal of Development and Agricultural Economics*, 1(2), 27-40.

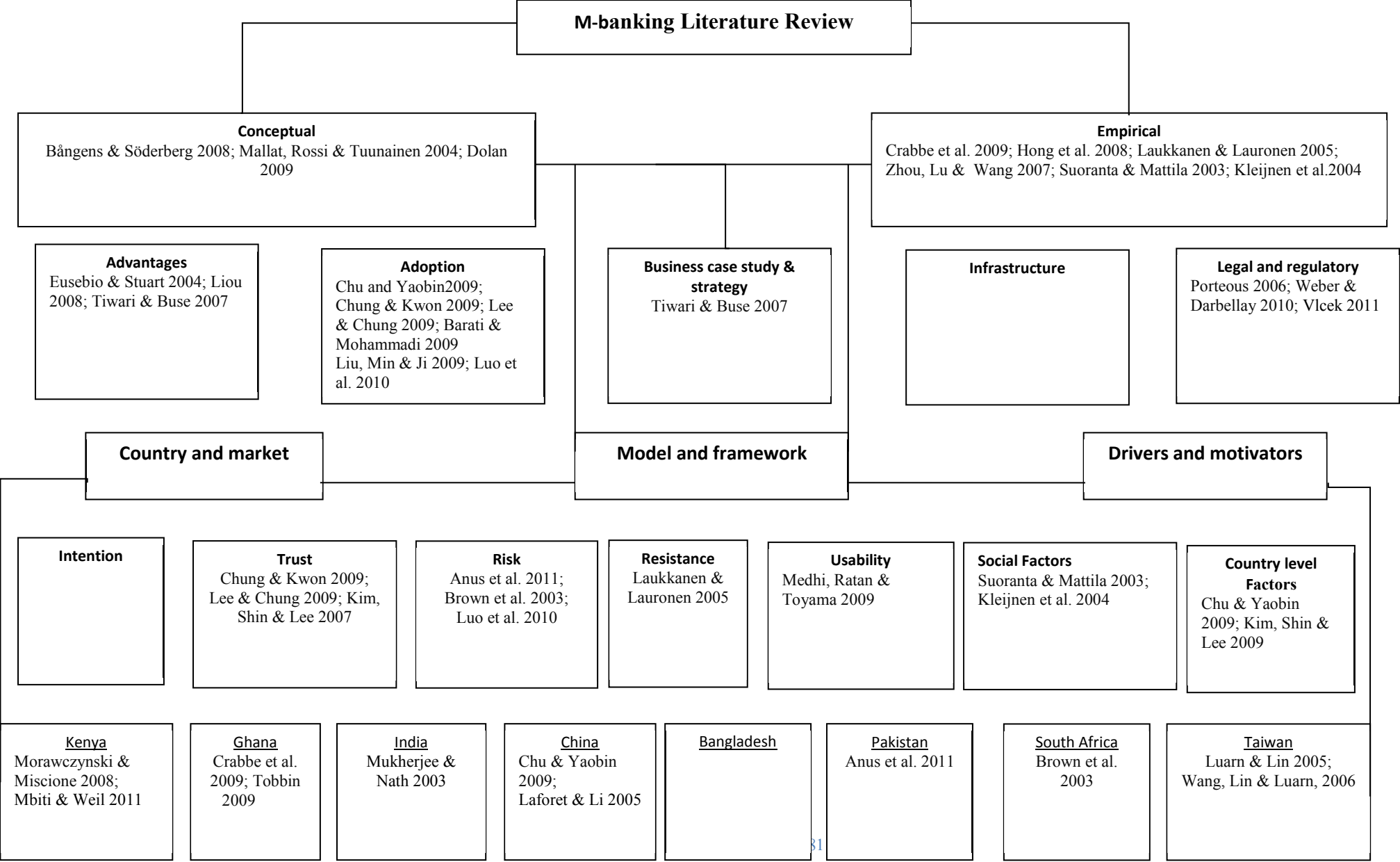
- Tarasewich, P., Nickerson, R. C., & Warkentin, M. 2002, 'Issues in mobile e-commerce', *Communications of the association for information systems*, 8(1), 41-64.
- Taylor, S & Todd, P. (1995a). 'Decomposition and crossover effects in the theory of planned behaviour: a study of consumer adoption intentions,' *International Journal of Research in Marketing*, 12, 137-55.
- Teo, T. S., & Pok, S. H. 2003, 'Adoption of WAP-enabled mobile phones among Internet users', *Omega*, 31(6), 483-498.
- The Central Intelligence Agency (CIA). 2013, 'Bangladesh', Viewed 31st November 2013, <https://www.cia.gov/library/publications/the-world-factbook/geos/bg.html>
- Tiwari, R., & Buse, S & Herstatt, C 2007, 'Mobile Services in Banking Sector: The Role of Innovative Business Solutions in Generating Competitive Advantage', *Proceedings of the International Research Conference on Quality, Innovation and Knowledge Management*, pp. 886–894,
- Tiwari, R., & Buse, S. 2007, 'The mobile commerce prospects A strategic Analysis of opportunities in the Banking sector', a joint research Paper by Institute of Technology & Innovation Management Hamburg University of Technology, Germany & Chair of International Management University of Hamburg, Germany
- Tiwari, R., Buse, S., & Herstatt, C. 2006, 'Mobile banking as business strategy: Impact of mobile technologies on customer behaviour and its implications for banks', In *Technology Management for the Global Future, 2006. PICMET 2006* (Vol. 4, pp. 1935-1946). IEEE.
- Tobbin, P. 2009, 'Modelling Adoption of Mobile Money Transfer: A Consumer Behaviour Analysis', *Money*, 2.
- Tobbin, P. 2012, 'Towards a model of adoption in mobile banking by the unbanked: a qualitative study', *Info*, 14(5), 74-88.
- Uddin, A. M. 2006, 'The Small and Medium Enterprises (SME) in Bangladesh: An Overview of the Current Status', paper, State University of Bangladesh, Dhaka (<http://www.beibd.org/beireport/sme/The%20Small%20and%20>
- UNESCO (2013), <http://www.accu.or.jp/litdbase/policy/bgd/>
- Venkatesh, V., Brown, S., & Bala, H. 2013, 'Bridging the qualitative-quantitative divide: Guidelines for conducting mixed methods research in information systems', *MIS Quarterly*, 37(1), 21-54.
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. 2003, 'User acceptance of information technology: Toward a unified view,' *MIS Quarterly*, 27, 3, 425–478.

- Vlcek, W. 2011, 'Global Anti-Money Laundering Standards and Developing Economies: The Regulation of Mobile Money', *Development Policy Review*, 29: 415–431. doi: 10.1111/j.1467-7679.2011.00540.x
- Wang, Y. S., Lin, H. H., & Luarn, P. 2006, 'Predicting consumer intention to use mobile services', *Information Systems Journal*, Vol. 16, No. 2, 157 – 179.
- Weber, R.H. & Darbellay, A. 2010, 'Legal issues in mobile banking', *Journal of Banking Regulation*, 11, 129-145.
- Wei, L. W. 2011, 'Online-to-Mobile Trust Transference: An Empirical Investigation', *7th International Conference on Wireless Communications, Networking and Mobile Computing (WiCOM)*, 1-4.
- Wessels, L., & Drennan, J. 2010, 'An investigation of consumer acceptance of M-banking', *International Journal of Bank Marketing*, 28(7), 547-568.
- Yang, K. 2011, 'Exploring factors affecting the adoption of mobile commerce in Singapore' *Telematics and Informatics*, 22, 3, 257-277.
- Yao, H. & Zhong, C 2011, 'The Analysis of Influencing Factors and Promotion Strategy for the Use of Mobile Banking,' *Canadian Social Science*, 7, 2, 60-63.
- Yin, R. K. 2010, 'Qualitative research from start to finish', *Guilford Press*, New York.
- Yin, R. K. 2011, 'Applications of case study research', *Sage Publications*, Incorporated.
- Ying, L. & Can. Z. 2010, 'Customer's Adoption Decision Analysis of Mobile Banking Service,' *International Conference on Management and Service Science*, vol., no., pp.1-4, 24-26 Aug. 2010.
- Zhou, T. 2011, 'An Empirical Examination of Initial Trust in Mobile Banking', *Internet Research*, vol. 21 Issue 5.
- Zhou, T., Lu, Y. & Wang, B. 2007, 'Integrating TTF and UTAUT to explain mobile banking user adoption,' *Computers in Human Behavior*, vol. 26, no. 4.

Appendix A: Bangladesh at a glance

Geography	
Location	Southern Asia, bordering the Bay of Bengal, between Burma and India
Area	Total: 143,998 sq km Irrigated land: 47,250 sq km water: 13,830 sq km
Land Boundaries	4,246 km
Border countries	India 4053 km, <i>surrounding almost every corner except south east.</i> Burma 193 km <i>along the south eastern side,</i>
Climate	Tropical; mild winter (October to March); hot, humid summer (March to June); humid, warm rainy monsoon (June to October)
Demography	
Population	156,050,883 (July 2009 est.)
Age structure	0-14 years: 34.6% (male 27,065,625/female 26,913,961) 15-64 years: 61.4% (male 45,222,182/female 50,537,052) 65 years and over: 4% (male 3,057,255/female 3,254,808) (2009 est.)
Population growth rate	1.292% (2009 est.)
Government	
Government type	Parliamentary democracy
Capital	Dhaka
Administrative division	6 divisions; Barisal, Chittagong, Dhaka, Khulna, Rajshahi, Sylhet
Independence	16 December 1971 (from West Pakistan); note - 26 March 1971 is the date of independence from West Pakistan, 16 December 1971 is known as Victory Day and commemorates the official creation of the state of Bangladesh
Economy	
GDP – real growth rate	4.9% (2008 est.) 6.2% (2007 est.) 6.4% (2006 est.)
Labour force	70.86 million
Population below poverty line	45% (2004 est.)
Unemployment rate	2.5%
Inflation rate (consumer prices)	9.4%
Exports	\$13.97 billion (2008 est.) country comparison to the world: <u>78</u>
Export commodities	Garments, jute and jute goods, leather, frozen fish and seafood
Imports	\$20.17 billion (2008 est.)
Import commodities	Machinery and equipment, chemicals, iron and steel, textiles, foodstuffs, petroleum products, cement

Appendix B: M-banking Literature Gap



Appendix C: M-banking Drivers and Factors

Factors		Study
Banking	Banking needs	Brown et al. 2003,
Mobile Characteristics	Convenience Time savings Immediately responses Location free service Self esteem	Crabbe et al. 2009, Hong et al. 2008, Laukkanen & Lauronen 2005, Zhou, Lu & Wang 2007,
Mobile Banking	Relative advantage	Chu & Yaobin 2009, Hong et al. 2008, Kim, Shin & Lee 2009, Zhou, Lu & Wang 2007,
	Usefulness	Barati & Mohammadi 2009, Kleijnen et al. 2004, Luarn & Lin 2005, Tobbin 2009, Wang, Lin & Luarn 2006,
	Ease of use	Barati & Mohammadi 2009, Chu & Yaobin 2009, Kleijnen et al. 2004, Luarn & Lin 2005,
	Compatibility	Brown et al. 2003, Chu & Yaobin 2009,
	Complexity	Brown et al. 2003,
	Credibility	Luarn & Lin 2005, Wang et al. 2003, Wang, Lin & Luarn 2006,
	Triability,	Brown et al. 2003,
	Trust	Anus et al. 2011, Chu & Yaobin 2009, Kim, Shin & Lee 2009, Liu, Min & Ji, Luo et al. 2010, Morawczynski & Miscione 2008, Zhou 2011.
	Risk	Anus et al. 2011, Brown et al. 2003, Luo et al. 2010
	Self-efficacy	Luarn & Lin 2005, Luo et al. 2010 Wang, Lin & Luarn 2006
	Cost	Kleijnen et al. 2004, Luarn & Lin 2005, Wang, Lin & Luarn 2006 Luo et al. 2010
	Usability	Ying & Can 2010
Quality	Systems quality Information quality Information presentation	Chung & Kwon 2009, Lee & Chung 2009,

User characteristics	Age Computer skills, m-readiness Internet experience	Anus et al. 2011, Barati & Mohammadi 2009, Chu & Yaobin 2009, Wessels & Drennan 2010, Kleijnen et al. 2004, Luo et al. 2010,
	Social factors	Suoranta & Mattila 2003, Kleijnen et al. 2004,
Others	Firm characteristics	Chu & Yaobin 2009, Kim, Shin & Lee 2009, Liu, Min & Ji 2009, Luo et al. 2010, Zhou, Lu & Wang 2007,
	Facilitating conditions	Brown et al. 2003,

Appendix D: Databases used for M-banking Literature Review

Online databases: ABI/INFORM database, ProQuest Direct, EBSCO Business Source Premier, Science Direct, IEEE Xplore, ACM Digital Library, AIS eLibrary, Google Scholar. Conference papers were from mainly from following conferences

Conference Papers: International Conference on Information Systems(ICIS), Hawaii International Conference on System Sciences(HICSS), Americas Conference on Information Systems(AMCIS), European Conference on Information Systems(ECIS), Pacific Asia Conference on Information Systems(PACIS), Australasian Conference on Information Systems, (ACIS), IEEE Conference proceedings Electronic Commerce International Conference on Electronic Commerce, ICEC International Conference on Electronic Business, ICEB, IADIS International Conference on E-Commerce, IADIS International Conference on WWW/Internet ,Mobile Commerce, International Conference on Mobile Business, ICMB (previously mBusiness) ,Mobility Roundtable

Appendix E: Extract from survey questionnaire

Participant's mobile phone and banking information

<p>1. Do you have a mobile phone</p> <p>A. Yes B. No, but I use others phone</p> <p>C. No, but I intend to get one</p> <p>D. No, I have no intention in owning one</p>	<p>2. The following best describe banking status of the SME</p> <p>A. Unbanked</p> <p>B. Owner's personal account is used in business</p> <p>C. Bank with government bank</p> <p>D. Bank with private bank</p> <p>E. Bank with post office</p> <p>F. Bank with NGO</p> <p>G. Other type of accounts</p>
<p>3. Which mobile network does your mobile phone belong to?</p> <p>A. Grameen Phone B. Bangla Link C. RobiD. WaridE. City Cell</p> <p>F. TeleTalk</p>	<p>4. Before tonight, have you heard that you can do your banking using your mobile phone?</p> <p>A. Yes</p> <p>B. No</p>

Banking status of the SME and the owners/managers

The following best describe banking satisfaction of the SME

- A. Very unhappy
- B. Unhappy
- C. No comments
- D. Happy
- E. Very Happy

The following best describe banking satisfaction of the SME owner/manager

- A. Very unhappy
- B. Unhappy
- C. No comments
- D. Happy
- E. Very Happy

M-banking advantages for SMEs

M-banking is advantageous for my business banking.
 Using m-banking would make it easier for me to conduct business banking.
 M-banking will allow me to manage my business more efficiently.
 M-banking is more convenient than traditional banking.
 I can pay to my city based whole seller by using mobile banking more effectively.

Perceived usefulness

I think an m-banking service is very in useful.
 I think m-banking services improve my performance.
 I think m-banking services enhance my effectiveness.
 I think mobile banking services increase my productivity by saving times.
 I think I can save my time by using m-banking services.
 I think I can save my money by using m-banking services.

Perceived Ease of Use

I think mobile banking services are user-friendly.
M-banking doesn't need a lot of mental effort to use the service.
Learning how to use m-banking is easy for me.
It would be easy for me to become skilful at using m-banking without getting customer support.
I think that I can learn how to use m-banking services easily without getting vocational training.

Perceived credibility

Using m-banking would not divulge my personal information.
I think that online transaction through mobile phone will create unexpected problems.

Perceived risk

I think that online transaction through mobile phone is risky.
I don't feel safe in online transaction through mobile phone.
I think that online transaction through mobile phone is not confidential.

Cost

I think it is expensive for me to buy a mobile banking enabled mobile phone.
I think it is expensive for me to access mobile banking services.
I think the transaction fee in mobile banking services is expensive for me.

Intention to use mobile banking service

If mobile banking is available, what would have done?

- I will use mobile banking service
- I am not sure
- I do not have intention to use mobile

Demographic Information:

Gender A. Male B. Female	Profession A. I am employed in the SME B. Owner of the SME
Age A. Below 18 years B. 18-25 years C. 25-30 years D. 30-35 years E. 35-40 years F. 40 and over	Monthly personal income A. Tk. 5000 or below B. Tk. 5000-10000 C. Tk. 10000-20000 D. Tk. 30000- 50000 E. Tk. Above 50000
Number of employees A. 1-5 persons B. 5-15 persons C. 15- 50 persons D. 50 to 250 Persons	Level of Education A. Primary or below B. Between Primary and high school C. Above year high School to university

Appendix F: Interview instruments (Bank officers)

INFORMATION LETTER

Investigating a Framework for Providing Mobile Banking Opportunities to Rural SMEs in Bangladesh

Dear participants,

I greatly appreciate the time you give me when I interview you. The interview is for the research 'Investigating a Framework for Providing Mobile Banking Opportunities to Rural SMEs in Bangladesh'. The study will investigate a mobile banking framework for rural SMEs in Bangladesh. The study will come up with an integrated framework including two features: firstly, what benefits can be achieved in rural SMEs through mobile banking facility and secondly, (2) how can mobile banking be developed using existing telecommunication and banking infrastructure.

Answering the questions indicates that you have understood the information provided about this research and that you have been given the opportunity to ask any questions and clarify if you have any questions.

Once again, please accept my thanks for your time. Without your granting me time to interview, it would not have been possible for me to complete my research.

Yours truly,

Md Taimur Ahad
Faculty of Engineering and Information Technology
University of Technology, Sydney, Australia
Email: md.t.ahad@student.uts.edu.au
Phone No: 0425213128

Local Contact
Sarkarpara
Gainbandha
Phone: 01752280569

BACKGROUND OF THE RESEARCH

What is Mobile Banking: Mobile Banking (M-banking) is an application of mobile phone that allows customers to do banking using the mobile phone anywhere/anytime.

Why M-banking is important for the rural SMEs? Small and Medium Enterprise (SME) in Bangladesh have been contributing to the national economy since independence. SMEs play an important role in the growth of GDP, employment generation, poverty alleviation and rapid industrialization. However, SMEs banking and financing is not satisfactory. The research intends to investigate an M-banking framework for providing banking opportunities to rural SMEs in Bangladesh.

Why not considering internet banking? Study indicates that internet usage in Bangladesh through computers is not increasing. High price of computers, lack of internet-computer infrastructure, low usage of English in rural areas are some common impediments of adopting internet banking in Bangladesh. However, high growth of mobile phone, solid nationwide mobile telecommunication infrastructure and customers acceptance of mobile phones give an opportunity to adopt mobile based banking services.

Description of the interview: The purpose of the interview is to explore M-banking for rural SMEs in Bangladesh. In the interview I will ask your views and opinion in a general discussion about M-banking adoption in your bank, Internet banking facility, M-banking facility (if you have), customers' preference and the future plan regarding implementing cutting edge technology like M-banking in your Bank. I will also ask some background demographic information such as age, gender, education, experience.

The interview will take one hour of your time. Your name will de-identified and your response will used in the thesis without mentioning your name and source. The interview will be audio recorded with your permission. The interview will be confidential and the data will be stored in a safe place in the researcher's home. I will contact you if this is necessary and arrange a meeting time and place that suits you best. I will send you the questions in advance.

INTERVIEW

Instruction: The attached guide gives you a brief outline of the type of questions I plan to ask during our interview.

Rural SMEs Banking

1. Please tell me about small and medium organizations (SMEs) customers of your bank. I like to know:
 - What is the nature of SMEs banking activities?
 - What are SMEs banking needs?
 - Are they banking literate?
 - Do they use bankcard, ATM or online banking?
2. What services and products does your bank offer to SMEs?
3. Do you have branch in village or remote area? (if not why)

IT, E-commerce and m-banking of your bank

4. Could you tell me about information technology, e-banking and m-banking in your bank?
5. Do you have m-banking? (if yes why have you adopted/if not why have you not adopted yet)
6. Could you tell me the possibilities of adopting mobile bank in your bank to provide banking services to the rural SMEs?
7. How do SMEs perceive banking using electronic devices like mobiles and computers compared to the traditional banking?
8. What steps have you taken to increase usage of electronic and mobile banking

M-banking infrastructures

9. Do you have organizational infrastructure and resources to adopt m-banking?
Please specify following topics
 - M-banking customers
 - M-banking technology
 - M-banking human resource

M-banking factors

10. What are the influential factors of M-banking to the customers do you think?
11. What are the drivers of M-banking for banks?
12. What are the barriers in M-banking adoption?
13. Is there any politics in M-banking industry? Such as
 - Competition among telecommunication industry and banking sectors.
 - Rivalry among M-banking industry and money transfer authority.
(Post office, Western Union, Money Gram).
14. M-banking needs regulatory environment. Please describe current legal framework of M-banking in Bangladesh.
15. M-banking needs partnerships among stakeholders. Do you have such partnerships with other stakeholders?

Recent development

16. What developments are in action to adopt M-banking?
17. What are your suggestions that will accelerate the adoption of M-banking?

Conclusion

18. Do you know anyone who can give me valuable information about m-banking and you think I should speak to?
19. Is there anything you would like to add?

PARTICIPANTS DEMOGRAPHIC INFORMATION

Instruction: Please tick in the square that corresponds to your answer.

1. What is your gender?

- ☐ A. Male
- ☐ B. Female
- ☐ C. Do not like to disclose

2. How old are you?

- ☐ A. 18-25 years
- ☐ B. 25-30 years
- ☐ C. 30-35 years
- ☐ D. 35-40 years
- ☐ E. 40-50 years
- ☐ F. Do not like to disclose

3. Level of Education:

- ☐ A. Under Graduate
- ☐ B. Graduate//Bachelor/ Honours
- ☐ C. Masters or above
- ☐ D. Do not like to disclose

4. Position _____

5. Experience (technology) _____

END OF THE QUESTIONS

Appendix G: Interview instruments (MTO officers)

INFORMATION LETTER

Investigating a Framework for Providing Mobile Banking Opportunities to Rural SMEs in Bangladesh

Dear participants,

I greatly appreciate the time you give me when I interview you. The interview is for the research 'Investigating a Framework for Providing Mobile Banking Opportunities to Rural SMEs in Bangladesh'. The study will investigate a mobile banking framework for rural SMEs in Bangladesh. The study will come up with an integrated framework including two features: firstly, what benefits can be achieved in rural SMEs through mobile banking facility and secondly, (2) how can mobile banking be developed using existing telecommunication and banking infrastructure.

Answering the questions indicates that you have understood the information provided about this research and that you have been given the opportunity to ask any questions and clarify if you have any questions.

Once again, please accept my thanks for your time. Without your granting me time to interview, it would not have been possible for me to complete my research.

Yours truly,

Md Taimur Ahad

Faculty of Engineering and Information Technology
University of Technology, Sydney, Australia
Email: md.t.ahad@student.uts.edu.au
Phone No: [REDACTED]

Local Contact
Sarkarpara
Gainbandha
Phone: [REDACTED]

BACKGROUND

What is Mobile Banking: Mobile Banking (M-banking) is an application of mobile phone that allows customers to do banking using the mobile phone anywhere/anytime.

Why mobile banking is important for the rural SMEs? Small and Medium Enterprise (SME) in Bangladesh have been contributing to the national economy since independence. SMEs play an important role in the growth of GDP, employment generation, poverty alleviation and rapid industrialization. However, SMEs banking and financing is not satisfactory. The research intends to investigate a mobile banking framework for providing banking opportunities to rural SMEs in Bangladesh.

Why not considering internet banking? Study indicates that internet usage in Bangladesh through computers is not increasing. High price of computers, lack of internet-computer infrastructure, low usage of English in rural areas are some common impediments of adopting internet banking in Bangladesh. However, high growth of mobile phone, solid nationwide mobile telecommunication infrastructure and customers acceptance of mobile phones give an opportunity to adopt mobile based banking services.

Description of the interview: The purpose of the interview is to explore mobile banking for rural SMEs in Bangladesh. In the interview I will ask your views and opinion in a general discussion about mobile banking adoption in your bank, Internet banking facility, Mobile Banking facility (if you have), customers' preference and the future plan regarding implementing cutting edge technology like mobile banking in your Bank. I will also ask some background demographic information such as age, gender, education, experience.

The interview will take one hour of your time. Your name will de-identified and your response will used in the thesis without mentioning your name and source. The interview will be audio recorded with your permission. The interview will be confidential and the data will be stored in a safe place in the researcher's home. I will contact you if this is necessary and arrange a meeting time and place that suits you best. I will send you the questions in advance.

INTERVIEW

Instruction: The attached guide gives you a brief outline of the type of questions I plan to ask during our interview.

Rural SMEs

1. Please tell me about small and medium organizations (SMEs). I like to know
 - What is the nature of SMEs banking activities?
 - What are their banking needs?
 - Are SMEs owner and managers banking literate?
 - Rural customers mobile phone usage pattern
2. Does commercial bank operate in rural areas? (if not why)

IT, E-commerce and m-banking

3. Could you tell me about information technology, e-banking and m-banking in Bangladesh?
4. Do we have m-banking in Bangladesh? (if yes why/ if not why)
5. Do you think rural customers are ready for m-banking service?
6. Could you tell me the possibilities of adopting mobile bank to provide services to the rural SMEs?
7. How do SMEs perceive banking using electronic devices like mobiles and computers compared to the traditional banking?
8. What steps are in progress to increase usage of electronic and M-banking?

M-banking drivers

9. Do you think Banks and Telecoms have organizational infrastructure and resources to adopt m-banking? Please specify following topics
 - M-banking customers
 - M-banking technology
 - M-banking human resource

Drivers

10. What are the influential factors of M-banking to the customers do you think?
11. What are the drivers of M-banking for banks and the telecoms?
12. What are the barriers in M-banking adoption?
13. Is there any politics in M-banking industry? Such as
 - Competition among telecommunication industry and banking sectors.
 - Rivalry among M-banking industry and money transfer authority.
(Post office, Western Union, Money Gram).
14. M-banking needs regulatory environment. Please describe current legal framework of M-banking in Bangladesh.
15. M-banking needs partnerships among stakeholders. How easy it is in Bangladesh to establish the required agreements for m-banking?

Recent development

16. What developments are in action in Bangladesh to adopt M-banking?
17. What are your suggestions that will accelerate the adoption of M-banking?

Conclusion

18. Do you know anyone who can give me valuable information about m-banking and you think I should speak to?
19. Is there anything you would like to add?

PARTICIPANTS DEMOGRAPHIC INFORMATION

Instruction: Please tick in the square that corresponds to your answer.

1. What is your gender?

- ☐ A. Male
- ☐ B. Female
- ☐ C. Do not like to disclose

2. How old are you?

- ☐ A. 18-25 years
- ☐ B. 25-30 years
- ☐ C. 30-35 years
- ☐ D. 35-40 years
- ☐ E. 40-50 years
- ☐ F. Do not like to disclose

3. Level of Education:

- ☐ A. Under Graduate
- ☐ B. Graduate//Bachelor/ Honours
- ☐ C. Masters or above
- ☐ D. Do not like to disclose

4. Position _____

5. Experience (technology) _____

END OF THE QUESTIONS

Appendix H: Interview instruments (Expert representatives)

INFORMATION LETTER

Investigating a Framework for Providing Mobile Banking Opportunities to Rural SMEs in Bangladesh

Dear participants,

I greatly appreciate the time you give me when I interview you. The interview is for the research 'Investigating a Framework for Providing M-banking Opportunities to Rural SMEs in Bangladesh'. The study will investigate an M-banking framework for rural SMEs in Bangladesh. The study will come up with an integrated framework including two features: firstly, what benefits can be achieved in rural SMEs through M-banking facility and secondly, (2) how can M-banking be developed using existing telecommunication and banking infrastructure.

Answering the questions indicates that you have understood the information provided about this research and that you have been given the opportunity to ask any questions and clarify if you have any questions.

Once again, please accept my thanks for your time. Without your granting me time to interview, it would not have been possible for me to complete my research.

Yours truly,

Md Taimur Ahad

Faculty of Engineering and Information Technology

University of Technology, Sydney, Australia

Email: md.t.ahad@student.uts.edu.au

Phone No: [REDACTED]

Local Contact

Sarkarpara

Gainbandha

Phone: [REDACTED]

BACKGROUND

What is M-banking: M-banking (M-banking) is an application of mobile phone that allows customers to do banking using the mobile phone anywhere/anytime.

Why M-banking is important for the rural SMEs? Small and Medium Enterprise (SME) in Bangladesh have been contributing to the national economy since independence. SMEs play an important role in the growth of GDP, employment generation, poverty alleviation and rapid industrialization. However, SMEs banking and financing is not satisfactory. The research intends to investigate an M-banking framework for providing banking opportunities to rural SMEs in Bangladesh.

Why not considering internet banking? Study indicates that internet usage in Bangladesh through computers is not increasing. High price of computers, lack of internet-computer infrastructure, low usage of English in rural areas are some common impediments of adopting internet banking in Bangladesh. However, high growth of mobile phone, solid nationwide mobile telecommunication infrastructure and customers acceptance of mobile phones give an opportunity to adopt mobile based banking services.

Description of the interview: The purpose of the interview is to explore M-banking for rural SMEs in Bangladesh. In the interview I will ask your views and opinion in a general discussion about M-banking adoption in your bank, Internet banking facility, M-banking facility (if you have), customers' preference and the future plan regarding implementing cutting edge technology like M-banking in your Bank. I will also ask some background demographic information such as age, gender, education, experience.

The interview will take one hour of your time. Your name will de-identified and your response will used in the thesis without mentioning your name and source. The interview will be audio recorded with your permission. The interview will be confidential and the data will be stored in a safe place in the researcher's home. I will contact you if this is necessary and arrange a meeting time and place that suits you best. I will send you the questions in advance.

INTERVIEW

Instruction: The attached guide gives you a brief outline of the type of questions I plan to ask during our interview.

Rural Customers mobile usage

1. Please tell me about rural customers of your organization. I like to know
 - Rural customers phone set (SMS, WAP or internet enable)
 - Rural customers mobile phone usage pattern
 - How do you provide services to rural customers? (sell product and after sales service)
 - How do you do marketing for rural customers?
 - How the rural customer pay mobile phone bills or purchase prepaid?
2. Do you have special services and products for rural SMEs?

IT, E-commerce and m-banking

3. Could you tell me about information technology, e-banking and m-banking in your organization?
4. Do you offer m-banking?
 - If yes, are you the adopter?
 - If yes is it in association with any bank?
 - If yes why have you adopted?
 - If not why have you not adopted yet?
5. Could you tell me the possibilities of adopting mobile bank to provide services to the rural SMEs?
6. How do rural customers perceive M-commerce specifically m-banking?
 - Do they buy ringtone/wallpaper for mobile Phone?
 - Do they pay utility bill such as water bill, electricity bill?
7. What steps have you taken to increase usage of electronic and mobile banking

M-banking infrastructure

8. Do you have organizational infrastructure and resources to adopt m-banking?

Please specify following topics

- M-banking customers
- M-banking technology
- M-banking human resource

M-banking factors

9. What are the influential factors of M-banking do you think?

10. What are the drivers of M-banking for telecommunication sectors and the customers?

11. What are the barriers in M-banking adoption?

12. Is there any politics in M-banking industry? Such as

- Competition among telecommunication industry and banking sectors.
- Rivalry among M-banking industry and money transfer authority.
(Post office, Western Union, Money Gram).

13. M-banking needs regulatory environment. Please describe current legal framework of M-banking in Bangladesh.

14. M-banking needs partnerships among stakeholders. Do you have partnership with other stakeholders?

Recent development in Bangladesh

15. What developments are in action to adopt M-banking?

16. What are your suggestions that will accelerate the adoption of M-banking?

Conclusion

17. Do you know anyone who can give me valuable information about m-banking and you think I should speak to?

18. Is there anything you would like to add?

PARTICIPANTS DEMOGRAPHIC INFORMATION

Instruction: Please tick in the square that corresponds to your answer.

1. What is your gender?

☐

A. Male

☐

B. Female

☐

C. Do not like to disclose

2. How old are you?

☐

A. 18-25 years

☐

B. 25-30 years

☐

C. 30-35 years

☐

D. 35-40 years

☐

E. 40-50 years

☐

F. Do not like to disclose

3. Level of Education:

☐

A. Under Graduate

☐

B. Graduate//Bachelor/ Honours

☐

C. Masters or above

☐

D. Do not like to disclose

4. Position _____

5. Experience (technology) _____

END OF THE QUESTIONS