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Opportunities and Challenges of M-commerce Adoption in Bangladesh: An Empirical Study

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Abstract

The objective of this research is to explore the opportunities and challenges of m-commerce adoption in Bangladesh. An empirical study is conducted to see the user's perception on this issue. The country has experienced a sheer adoption of mobile phone, around 70%, one of the biggest advantages for m-commerce adoption. Findings indicate a positive trend of m-commerce uptake in Bangladesh. More than 60% of the survey participants used mobile internet although mobile broadband, the key feature for m-commerce, has not been available in the country until the time of the study. Adoption of mobile financial services is also promising; for example, 40.5% used mobile balance transfer. Users of mobile billing (28%), mobile ticketing (21%), mobile remittance (16%) and mobile banking or SMS banking (10%) are also growing. Network infrastructure has continually been upgraded with the advance technologies including the recent launch of 3G mobile network. Study found that the lack of trust and literacy are the two major challenges of m-commerce growth in Bangladesh. Stakeholders need to make strategic plans to deal with these challenges and opportunities for rapid uptake of m-commerce in Bangladesh.

Keywords: **Mobile commerce; M-commerce; E-commerce; Mobile communication; Challenges; Opportunities; Bangladesh**

INTRODUCTION

Mobile phone is probably the fastest adopted technology ever, adding nearly 5 billion subscribers in the last decade, from 2 billion in 2004 to 7 billion in 2014 [1]. The dramatic adoption of mobile phone has opened up new opportunities and frontiers of M-commerce for the 21st century. M-commerce is considered to be a subset of e-commerce, sometimes it is called as mobile e-commerce Donegan , Liebmann, Schwartz cited in Zhang and Yuan [2]. Whenever e-commerce transactions are made through mobile phone or any handheld devices it is called m-commerce Chan and Fang, Kannan et al., Varshney et al., cited in Chan, Fang and Brzezinski [3].

The convergence of mobile internet and smart phone has made the mobile phone a powerful tool that is no longer being used for communication only but also for doing numerous jobs and activities. Near Field Communication (NFC) and Radio Frequency Identification (RFID) technologies are already integrated with smart phone for mobile payment and tracking of goods and parcels [4-7]. Users of smart phone are also able to perform various jobs through the help of smart phone Apps, which are countless. Today mobile phones are being used for web browsing, location tracking, and watching news, sports, videos, music through mobile internet, m-payment such as performing wireless transaction for banking, shopping, ticketing through mobile phone [8-14].

M-commerce market is booming, expected to reach $119 billion by the end of 2015 [15]. M-commerce already generated $1.3 trillion revenue worldwide and predicted to reach $1.8 trillion in 2016 Portio research 2009 cited in Nassuora [16]. Researchers are optimistic on the rapid growth of m-commerce due to its unique features over e-commerce such as:

a. Instantaneity, localization, and identification [8].
b. Ubiquity: Mobile devices are carried by the end users at all times, allowing them to use m-commerce at anytime and anywhere [8,17,18].
c. Personalization: Mobile phones are personal devices and not usually shared by multiple users [17]. The owners can maintain their privacy and the mobile network can provide some personalized services to the end users [8,18].
d. Convenience: The size and weight [17], coupled with some sophisticated applications made the mobile device a convenient tool for the user.

M-commerce like other technologies does not lack of flaws and draw backs. Such as

a. Small screen and keypad: These are among the main draw backs of m-commerce [18,19]. The users need to scroll a lot to read the screen and many keystrokes are needed for its limited keypad.

b. Lost or stolen: The mobile phone can be lost or stolen easily [20] and so data and information is lost and may be misused.

c. Limited memory and bandwidth: The memory and the computing power of mobile phones are lower than computers; complicated processing on client side is therefore not facilitated [18,21] and although 3G transmission has made mobile communication faster, further upgrade is needed.

d. Lack of trust and security: Security is among the greatest challenges of m-commerce [17,22-29]. In most cases, m-commerce firms require the same security controls used for e-commerce. As m-commerce basically facilitates the financial transaction, tight security and privacy should be maintained to restore the trust of the consumers [30].

e. Lack of literacy: Lack of literacy may not be a barrier for mobile commerce adoption [31,32] but it may be a challenge for the adoption of mobile banking where consumers may need to enter their Id and password and should be able to read their bank statement individually. These are something that should be not be compromised to third party [33].

RESEARCH OBJECTIVE

What are the opportunities and challenges of m-commerce uptake in Bangladesh?

The objective of this study is to get the answer of the above research question. An empirical study including survey was conducted to see the consumer's perception on this issue. Field notes were collected during the face to face surveys. Data from secondary resources also contributed to the findings. The author had to review and analyze critically some areas of m-commerce in Bangladesh to explore the answer of the research question. Studying the areas such as the history of mobile communication, network infrastructure and types of services (m-commerce) available in Bangladesh helped author to judge how well Bangladesh is prepared to deal with potential challenges and opportunities in the m-commerce arena.

Brief history of mobile communication in Bangladesh

Bangladesh entered the era of mobile communication in 1989 when the first operator license was issued to Pacific Bangladesh Telecom Ltd for providing mobile phone and paging services in collaboration with the Hong Kong Based company [34]. It began its operation in 1993 under the brand name of City Cell by introducing Advanced Mobile Phone System (AMPS), and continued

monopoly until 1996 [34,35]. During the era of monopoly, the mobile sector grew very slowly and mobile phones were only affordable to the elite because of the high charges and expenditures [35]. It was the GATS (General Agreements on Trade in Services), that enabled some commitment from Bangladesh in 1997 to reorganize and restructure its telecommunication policy to ensure competition through liberalization and privatization [34]. According to the GATS agreement, Bangladesh was committed to issue licenses to two private operators for providing long distance and local voice services and transmission facilities, and another four licenses to cellular mobile phone operators.

Grameen Phone (GP), a joint venture enterprise between Telenor (55.8%) of Norway and Grameen telecom (34.2%) of Grameen Bank, began its operation in 1997 and Sheba Telecom (brand name Aktel) entered at full-fledged 1998 (Telenor website). Grameen Phone has become the largest mobile operator in Bangladesh having 42.3% market share and over 49.5 million subscribers throughout the country [24]. It has continued to dominate this industry with its competitive price and services since started in 1997 [36,37]. In 2004 Sheba Telecom sold its 100% ownership to an Egypt based company “Orascom telecom” which began its operation in 2005 under the brand name of Banglalink [35,38]. Banglalink remained the second biggest mobile operator in Bangladesh achieving 25.4% market share and 29.7 million subscribers throughout the country [24,38]. Two more mobile operators, Teletalk and Warid, were issued licenses in 2004 and 2005 respectively; Teletalk is the public owned mobile operator running under BTTB [35].

Currently there are six mobile operators in Bangladesh whose market shares are as follows: Grameen Phone (42.3%), Banglalink (25.4%), Robi (20.6%), Airtel Bangladesh (7.1%), Teletalk (3.1%) and Citycell (1.1%) [24]. Mobile phone in Bangladesh was adopted very quickly. The number of mobile subscribers in Bangladesh which was only 2500 in 1995 has jumped to 52,900 in 1997 [34] and by 2002 that has crossed the million landmark surpassing the total number of fixed phone subscribers [1,39]. By July 2014 the number of mobile phone subscribers has reached to 117 million, accounting for 70% of the total population in Bangladesh [24].

Network infrastructure of the country

The Bangladesh Government approved the National ICT Policy in October 2002 for the rapid development of ICT [40,41]. The aim of this policy was to build up a nation, driven by knowledge and ICT by the year 2006 [40,41] which has not yet been achieved. Information and Communication Technology (ICT) was announced as the thrust sector of the government [41-43]. “Digital Bangladesh by 2021” was one of the top agendas of the ruling party’s election manifesto 2008 [44]. Digitization started by converting all analogue exchanges at 64 District HQ to digital by BTTB [41,45]. In Bangladesh the major infrastructure in mobile

ICT includes Telecommunication Satellite and Earth station, International maritime Satellite Communication, VSAT, Internet and data network, International Switching Centres, Optical fiber network and Submarine cable.

Submarine cable: Bangladesh has been officially connected to the Information Super Highway through Submarine Cable SEA-MEWE- 4 since May, 2006 [40,41,45,46]. South East Asia Middle East West Europe - 4 (SEA-ME-WE-4) is a submarine cable consortium connecting a total of 14 countries at 16 landing stations. The total length of the cable is approximately 22,000 km [46]. The consortium constructed a high capacity submarine fiber optic cable link where the initial equipped capacity on the Ready for Customer Services (RFCS) rate was 160 gbps, and the designed capacity of the system was 1.28 tbps [46]. Presently 5,055 voice circuits are in operation with different countries through the submarine cable. In the meantime, 66 ISPs (International Service Providers) have been connected through the submarine cable system. Bangladesh is earning generous revenue from this submarine cable [45].

Telecommunication satellite and earth station: According to the annual report of BTTB [45], BTTB has established 4 Earth stations to facilitate transmission of incoming and outgoing overseas calls through satellite, three of which are still in operation. The earth station which consists of the largest international circuit facilities was installed in 1994 at Mohakhali, Dhaka. This earth station is used to access 4,211 (voice 3,950+ VFT 2+ Data 259) international circuits among 17 countries.Bangladesh is the first optical fiber network user in Asia. It established an 1,800 km long optical fiber network for Bangladesh Railway in 1986 along with the installation of digital switching [41,46,47]. Twenty one Optical Fiber Backbone Links in Bangladesh have already been completed by BTTB, which established a communication through north-south of Bangladesh [45].

International Maritime Satellite Communication (INMARSAT): INMARSAT (International maritime Satellite Communication) service is the mobile satellite communication system that links the mobile earth station on vessel or aircrafts with land earth stations around the world via the INMARSAT satellite in geo-stationery orbit. Until 2006 BTTB had five INMARSAT-A Terminals which are operating through one LES (Land Earth Station) located in Jeddah [45].

VSAT: Very Small Aperture Terminal (VSAT) was introduced in Bangladesh in 1996 when the government allowed private entrepreneurs to act as Internet Service Providers (ISPs) using VSAT [46]. There are now 12 VSAT providers and 44 VSAT users in Bangladesh [24].

Internet and data network: The internet came late to Bangladesh, with UUCP e-mail beginning in 1993 and IP connectivity in 1996 [46]. BTTB (renamed as BTCL) is now providing Internet access services to its subscribers. The services include dial-up access service, leased access services for enterprises, access for

local ISPs, mail, web hosting, .bd name registration and DNS services [45]. In addition to this, a hightech park, software Technology Park, ICT incubator and computer villages will be set up at suitable locations in the country [44]. BTRC (Bangladesh Telecommunication Regulatory Commission) has taken up some of the latest telecommunication projects, among them WiMax services (Wireless broadband services), IP telephony and launching Satellite are in progress. All of them will consolidate the country's telecommunications infrastructure and provide better service in the near future.

3G opens the doors for mobile broadband: The arrival of 3G is the biggest milestone in the history of mobile commerce of Bangladesh. The four operators bid for 3G spectrum on 8th September 2013 [48]. The largest operator Grameenphone paid $210 million for 10 megahertz spectrum, while the other three Banglalink, Robi and Airtel paid $105 million each for 5 MHz respectively [48,49]. 3G is expected to accelerate high speed data over the mobile network, the essential feature for m-commerce today.

Types of M-commerce services offered in Bangladesh

From the Bangladeshi perspective, Mobile commerce means mobile financial services, which includes mobile billing, mobile ticketing, mobile remittance, balance transfer and mobile banking. Other services of m-commerce such as watching news, sports, videos, music through mobile internet are considered as value added service (VAS) in Bangladesh.

BillPay through mobile phone: Utility bill payment through mobile phone called 'BillPay' was first launched in Bangladesh in 2006 by the leading mobile operator Grameen Phone in a joint venture with the Bangladesh Power and Development Board (PDB) [50]. Customers responded very positively to this 'BillPay' service because of quick and convenience when compared to traditional services. In 2007 the number of bills paid through Grameen Phone's 'BillPay' service were 141,000, which increased sharply to 1.66 million in 2009 and worth over 1.64 billion taka (~ $21million) [50]. 10.78 million taka (~$135K) was earned as revenue through this Grameen Phone's 'BillPay' service in 2010 [51].

Mobile remittance: Bangladesh is moving towards its commitment of being digitized by launching a remittance transferring system through mobile phones. Mobile remittance was first offered in Bangladesh as well as in south Asia by Banglalink, the second biggest operator in Bangladesh, in April 2010, jointly with two leading banks, Dhaka Bank Ltd and Eastern Bank Ltd [52,53]. Bangladeshi expatriates will be able to send their money easily and quickly within a day through their mobile phone free of cost [54].

Mobile ticketing: Buying train ticket through mobile phone called 'Mobitaka' was first introduced by Grameen Phone, jointly with Bangladesh Railway, on 4th of March 2010 [51]. It saved time and helped to avoid the painful traffic jams of

Bangladesh. Customers using Grameen Phone's 'Mobitaka' service are able to book or purchase a railway ticket 10 days prior to their travel. The only inconvenience of this system is that the customers need to collect their paper ticket from the train station at least one hour prior to the departure by showing their digital ticket to the counter [55].

Mobile banking: Mobile banking in Bangladesh is normally called SMS banking because the account balance and transaction information are sent to the customer's mobile phones as SMS (BRAC Bank, Premier Bank, Dhaka Bank and Standard Chartered Bank). Recently, Bangladesh Bank has permitted 10 banks to initiate actual mobile banking. Dutch Bangla Bank (DBBL) first launched fully fledged mobile banking in Bangladesh in cooperation with two mobile operators, CityCell and BanglaLink [56,57]. All the mobile banking services offered by DBBL are in compliance with the guidelines of the Bangladesh Bank, a governing body of financial services in Bangladesh. These include cashin, cash-out, merchant payment, utility payment, salary disbursement, foreign remittance and fund transfer with capped limit of 5000Tk per transaction for cash-in and cash out [58,59]. Mobile banking could be a blessing for Bangladesh where 85 percent people do not have bank accounts but the mobile phone penetration is over 50 percent [60].

'Bkash' is a successful brand name for mobile financial services in Bangladesh. Since launched in July 2011 Bkash has registered 2.2 million customers. Thirty thousand agents are working on behalf of Bkash who spread throughout the country covering almost 90% mobile users. Once the Bkash users have electronic money in their mobile wallet account they can access a range of services including person to person (P2P) transfer, International remittance, merchant payment with a small service fee such as BDT 2 ($.02) for P2P transfer and fee for cash out is just 1.85% of the total cash withdrawn. Customers can walk in to an agent, spread like mushroom, for cash in and cash out of their mobile wallet account [61]. BRAC Bank, Bill and Melinda Gates foundation and the four major MNOs are behind Bkash who are providing their technical and financial support until today [61].

Information and entertainment based mobile services: Cellbazar, an information based mobile commerce application, was launched by Grameen Phone in 2006 [50,51]. It was founded by Kamal Quadir with his innovative idea of bringing the local market into the mobile phone. Cell Bazaar, the unique application of Grameen Phone, facilitates the buying and selling of products over the mobile phone. It's becoming popular in Bangladesh achieving 1.5 million users and with 90,000 hits a day [62]. Similar services were also offered later by other mobile operators such as Banglalink and Robi [38,63]. Many other information based mobile services provided by Banglalink are travel guide, news for agriculture, job link, marriage link, health link, blood bank, Islamic services, emergency services and etc. [38]. Various entertainment based services are also provided by the

leading MNOs of Bangladesh including mobile radio, music, ring tone, friend finder, BBC Bangla, song dedication and etc.

RESEARCH METHODOLOGY

Survey was conducted in December 2010. Field notes were also collected during the face to face surveys and used as another resource of this study. Different types of users of m-commerce ranging from high to low were included in the sampling to keep up with the real usage pattern. The two major cities of Bangladesh such as Dhaka and Chittagong were selected for the purpose of getting high users of mobile commerce. On the other hand, medium or low users were thought to be found in the district towns and rural areas. Therefore the two district towns of Mymensingh and Kishoreganj and their surrounding rural areas were selected for the study. Face to face and often one to one surveys were conducted in the study as the majority of the participants were among the semi-literate and illiterate.

Male and female, rich and poor within the age group of 16 to 65 were targeted in those areas. 575 completed surveys were returned from the total of 630 surveys delivered, leaving a response rate of 91%. 72.2% of the survey participants were male compared to 27.8% female. Around 73% of the respondents came from the two big cities of Bangladesh, Dhaka and Chittagong, accounting for 36.9% and 36.2% of the responses respectively.

A survey instrument – questionnaire was developed from previous research and then refined through pre-interviews and pilot surveys. Each question was measured by a seven-point Likert scale ranging from strongly agree as “1” to strongly disagree as “7”. The most common constructs - perceived usefulness, perceived ease of use and behavioural intention to use - were adopted from prior studies of the TAM [64-70]. Other survey items including perceived risk [69-71], cost [67,72-74] and personal awareness [75] were also adopted from previous studies and modified to make it meaningful to the participants. The survey questionnaire was refined through various stages of the pilot survey to ensure consistency, clarity and intelligibility.

RESULTS AND DISCUSSION

Analysis of the actual usage

Survey results further reveal that some m-commerce services such as m-billing, m-ticketing and m-banking (SMS banking) have attracted 28.5%, 21% and 10% users respectively. Another interesting finding is the mobile internet which has been used by 60% of the survey participants, a finding not expected. The usage pattern of m-commerce services in Bangladesh, another finding of the current study, is illustrated in Figure 1 below:

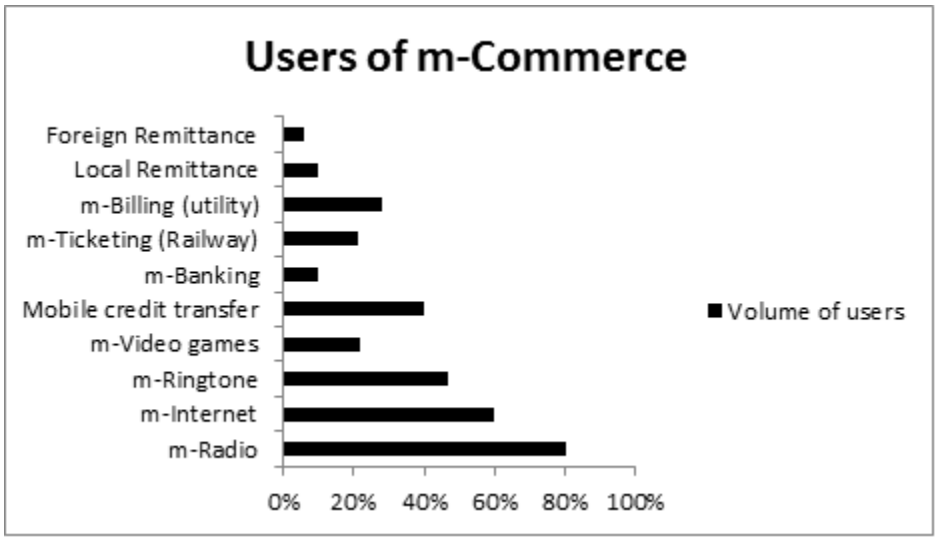

Figure 1: How m-commerce is used in Bangladesh.

It is evident that a large number of participants, around 90.2%, used fm-radio in their mobile phone, which is quite cheap with access fee only around $0.003/min [76] and that could be one of the reasons behind this high uptake. Adoption of mobile internet was also very surprising in this country which is 60.3%, meaning 347 out of 575 participants used mobile internet - that was not expected before the survey. Mobile balance transfer seemed to be popular among all other mobile financial services in Bangladesh and was used by 233 participants (40.5%) compared to only 60 users (10%) of m-Banking. The detailed list of m-commerce application usage is shown in Table 1.

Table 1: Various types of m-commerce uses, categorized between male and female.

			Gender			
	Female		**Male**		**Total**	
	Count	**%**	**Count**	**%**	**Count**	**%**
I used mobile phone for m-Railway ticketing	29	18%	94	22.6%	123	21.4%
I used mobile phone for m-Billing	38	23.7%	126	30.3%	164	28.5%
I used mobile phone for local Remittance	11	7%	48	11.5%	59	10.2%
I used mobile phone for foreign	6	3.7%	29	7%	35	6%

Remittance						
I used mobile phone for m-banking	12	7.5%	48	11.5%	60	10.4%
I used mobile phone for balance transfer	62	38.7%	171	41.2%	233	40.5%
I used mobile phone for listening radio	132	82.5%	329	79.2%	461	80%
I used mobile phone for updated news	68	42.5%	188	45.3%	256	44.5%
I used mobile phone for internet modem	43	26.8%	126	30.3%	169	29.3%
I used mobile phone for my mobile phone	101	63%	246	59.3%	347	60.3%
I used mobile phone for facebook	85	53%	188	45.3%	273	47.4%
I used mobile phone for email	62	38.7%	146	35.2%	208	36%
I used mobile phone for reading newspaper	44	27.5%	110	26.5%	154	26.8%
I used mobile phone for ringtones download	66	41.2	206	49.6	272	47.3
I used mobile phone for video games	22	13.7	106	25.5	128	22.2
I used mobile phone for videos	24	15	104	25	128	22.2

M-commerce is usually concerned with buying and selling goods and services through a mobile phone. It is also interesting to see the intention of the participants to use m-commerce services based on their age, gender, location, literacy etc. The intention to use m-commerce services, male compared with female, is shown in Figure 2 below.

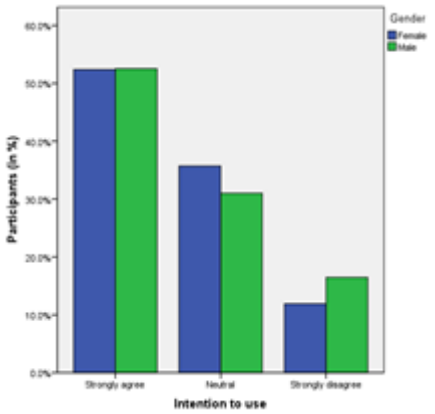

Figure 2: The intention to use m-commerce services male and female.

The above figure shows a similar pattern of intention to using the m-commerce services for both male and female such as around 52.5% of both sexes have strong intention to use m-commerce services. However, more male than female strongly disagree in their intention to use m-commerce services, for example 16.5% of the male participants strongly intended not to use m-commerce services compared to its female counterpart which is only 11.9%. Figure 3 shows the frequency of same construct, i.e. intention to use m-commerce among the various literacy levels of the participants.

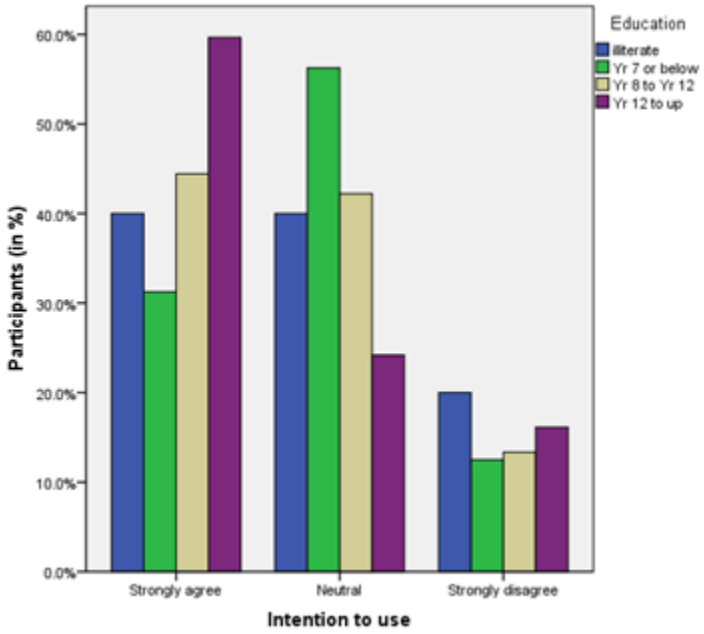

Figure 3: Intention to use m-commerce among the various literacy levels of the participants.

It was seen that a strong intention to use m-commerce services increases

according to the level of the literacy of the participants; such as 40% of the illiterate people but 44.4% and 59.7% of the literate and highly literate people have showed their strong intention to use m-commerce services respectively. The intention to use m-commerce services among different suburbs is shown in Figure 4. More than 50% of the respondents in all major areas have a strong intention to use m-commerce services, except for Chittagong (urban) and Iswarganj (rural) where this rate is 40% and 28% respectively. The highest number of participants who have a strong intention to use m-commerce services belongs to one of the semi urban areas, Kishoreganj, weighting 65%.

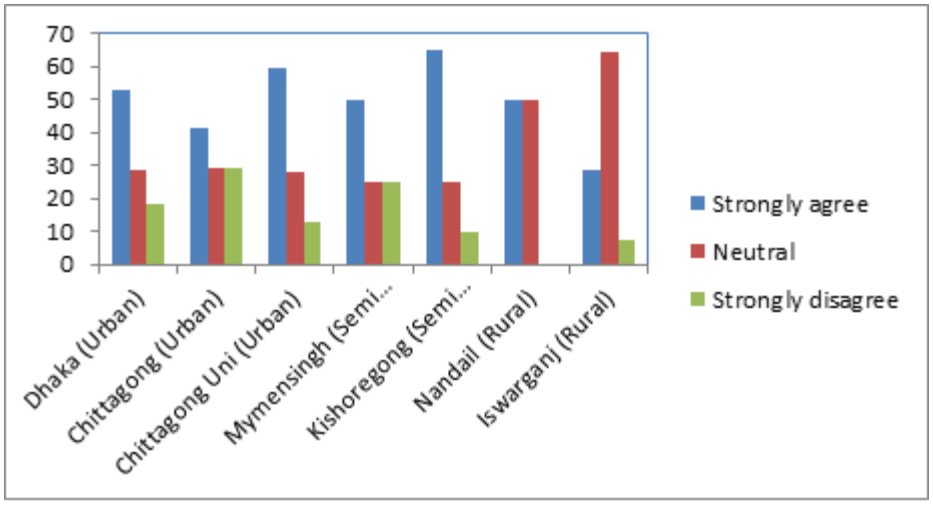

Figure 4: Intention to use m-commerce services among various locations.

Analysis of user's perception – collected as field notes

As the method of survey was face to face the researcher had the opportunity to ask probing questions to the participants, especially asking the reason why or why not does he/she intend to use m-commerce services. A mixed perception was found among the participants while answering these questions. These answers were recorded as field notes. Lack of trust, literacy and awareness were considered by the participants as among the biggest challenges of m-commerce adoption in Bangladesh.

Lack of trust: Trust is crucial for any business. Other factors are also important such as cost, perceived usefulness, perceived complexity, perceived risk, privacy and security. In the field of m-commerce, trust was found to be inversely related with risk i.e. high risk means low trust and vice versa [77]. Siau and Zixing [30] emphasized that there are some issues that build up consumer trust in m-commerce, such as privacy, security and integrity – if these are assured, that lower the risk and increase trust. Other issues are also involved with trust such as user's experience, poor relationship, bad reputation, stakeholder's unethical business practice and risk [77-80]. As many factors interlinked with trust, it was

considered to be the major challenge for m-commerce uptake. With these in mind the participants were asked to express their views on trust, meaning do they really believe the stakeholders of m-commerce are trustworthy enough?

No major allegations or complaints were reported by the participants against any other stakeholders except telcos. Telcos are the only stakeholder of m-commerce that has received a large number of complaints (mostly minor) from the users. The user's complaints were reported in the field notes and compiled as follows:

• A few consumers failed to receive the service that has already been paid for.
• A few deprived consumers were never been compensated – accused telcos of practicing business unethically.
• Telco's customer service was poor and expensive - it was not free of cost. The service calls incur additional expenses.
• Telcos have been lobbying for Telco-led mobile banking in Bangladesh even though they are not willing to take on any liabilities or risk.
• In some cases telcos have been accused of providing little or no access to the stakeholders (other players of m-commerce such as system developer, bank, private consultants etc.) especially where there is no financial or strategic benefit to the telco.

The allegations against telcos were not investigated as that was beyond the scope of the current study. It is obvious that these allegations affect the consumer's trust. Lack of trust has been identified as among the major barriers of m-commerce adoption in Bangladesh [33]. Trust is a very sophisticated issue and must be dealt with intelligence as every customer is valued in every aspect of a business process such as providing excellent customer service, maintaining high level of security and privacy, upholding reputation and ethical business practice. Telcos need to address these issues and should take some initiatives to resolve any potential conflict with the consumers to avoid their reputation and trust being hampered.

Lack of awareness: A large number of people already know about the different types of m-commerce services available in Bangladesh through mass media advertising, nevertheless the uptake of m-commerce remains low. The view is supported by many participants:

No I don't think that the lack of awareness is a major barrier for mobile banking since once a new technology is perceived to be useful then people will know it automatically and they will grab it from both of their hands. – Govt. Official 2

"I don't think so. It might have the minor affect but not major definitely. Because the message that mobile phone can be used for these that services is being reached to the people through various media advertisements". – Telco 5

"So lack of aware is also a barrier but not the main barrier because it can be covered up by mass advertisement". – Telco 6

"I think lack of awareness is among the major barrier. Because we are campaigning a lot but people are not coming as expected". – Telco 7

Majority of the participants were found to be aware of m-commerce services but their usage was still very low. Participants were asked whether they knew about m-commerce services but their level of awareness, meaning in-depth knowledge, was not measured. This detail, if included, would have been a separate research dealing with the awareness/knowledge of mobile commerce but was beyond the scope of the current study. Therefore Personal awareness reflects in this study may not represent the participant's in depth knowledge of mobile commerce, but rather it reports whether a person is aware of various m-commerce services or not. The result may have been different if the participant's in-depth knowledge of m-commerce was measured and tested to see how that in-depth knowledge affects their intention to use m-commerce services.

Lack of literacy – the challenge being overcome by customer care point (CCP): Lack of literacy is a common problem for most of the developing countries but is especially problematic for Bangladesh where the majority of people are illiterate i.e. 52.1% [81]. In case of m-commerce adoption minimum level of literacy is required, as reported

"One major barrier is the literacy since a mass population is illiterate." - Govt. Official 1

"I think, the education level is one of the major barriers here also people's perception." – Banker 1

"To be honest we have very few literate clients and I think that is one of the major barriers." – Banker 3

Despite this, mobile phones are being used by many illiterate people in Bangladesh, although in a limited way, as reported by one of the participants.

"You will see a lot of people in our country are using mobile phone. Even the illiterate people have mobile phone for them. They might not know many functions of mobile phone but they at least know how to call and receive a phone call." – Solution provider 1

The survey analysis found that 40% of the illiterate people have strong intention to use m-commerce services. It means that even the illiterate people realize the benefits of m-commerce. For example, one of the survey participants who were

an illiterate rickshaw puller (a three wheel vehicle, paddled by human being) preferred mobile transaction over cash transaction because the former would leave an evidence or document. It is still a challenge to cover the vast majority of illiterate people under the m-commerce services as minimum level of literacy is required.

"But mobile banking is not that simple as that needs an individual to read an SMS and use keypad to enter his/her password and ID. So it will be a big challenge for us to integrate the illiterate people in the coverage of mobile banking as it needs some level of literacy I believe."– Banker 2

They also discussed their future strategies to overcome the barrier of illiteracy so that illiterate people could be brought under mobile financial services. It's been acknowledged that illiteracy can't be removed from the country quickly but there will be a way out for illiterate people so they can get the maximum benefit from m-commerce services. One of the alternatives that could bring the illiterate people under the m-commerce services is customer care point (CCP) – as reported.

"So the people who are illiterate or can't perform any mobile payment activities, they still can get the benefit of mobile commerce through our OTC service, which is over the counter service (means customer care point, CCP)." – Telco 1

"We can say these illiterate people also have potential to become our one of the main m-commerce customers because of these outlets (means customer care point CCP)." – Telco 3

"CCP spread like mushroom in our country. Almost everyone goes to CCP (customer care point), no matter he is literate or illiterate, just because of convenience." – Solution provider 3

Therefore it is expected that the wide spread of CCPs (customer care point) can help overcome the literacy barrier for m-commerce adoption in Bangladesh. The CCPs may become the choice of consumers for conducting m-commerce or mobile financial services but could that be effective for mobile banking? is still a question as the chances of confidentiality being compromised to third party are relatively high in this case.

DISCUSSION AND CONCLUSION

There is a huge potential for m-commerce growth in Bangladesh because of some advantages such as rapid adoption of mobile phone precondition for m-commerce adoption, large unbanked population; approximately 85% potential customers for mobile banking, network infrastructure upgraded with advanced technologies, government policies – prioritized for "Digital Bangladesh by 2021"

[44] and high intention of the users to use m-commerce services (52.5% found in current study). Many people already used varieties of m-commerce services and applications in Bangladesh (Table 1 and Figure 1) which indicates a positive trend for m-commerce uptake in near future. Also Mobile banking has a great demand in Bangladesh as a large population is unbanked. A number of different stakeholders including mobile operators, banks, solution providers and the government bodies are working together to build a secure and efficient mobile banking system in Bangladesh [46]. All these opportunities need to be perceived and nurtured by the stakeholders of Bangladesh for moving towards the right direction. They must ensure that these opportunities should not be missed out overtime due to mismanagement or bureaucracy.

At the same time they should acknowledge the challenges of m-commerce and must be prepared to deal with these challenges with proper initiatives and actions. Although lack of literacy was perceived by the stakeholders to be the largest barrier to m-commerce adoption, the author recommends that it can be overcome with the help of customer care points (CCP), highly demanding service that spread like mushroom throughout the country. Customer care point (CCP) has become very popular in Bangladesh for various m-commerce services such as m-billing, m-ticketing, m-remittance, etc. However it may not be suitable for mobile banking as the user's confidentiality may be compromised when dealt with third party like CCP. Also two unique characteristics of m-commerce, ubiquities and independence, have not been achieved in Bangladesh because of the CCPs. They still need to arrange their time to travel to the CCP for accessing any m-commerce services; as a result they are not getting the full advantage of m-commerce. It's is the stakeholder's responsibility to make this possible through the latest technologies and research.

Interactive Voice Recorder (IVR) may help illiterate people in mobile banking, allowing them to talk and listen rather than to read and write, but still may not be suitable as there are some limitations in understanding the accents of the interaction between machine and human. Stakeholders reported that Bangladeshis feel less comfortable with machine interactions than people in other cultures. Other latest technologies such as Radio Frequency Identification (RFID) and Near Field Communication (NFC) can be integrated into mobile banking reducing the necessity of typing rather it facilitates the scanning of a bar code at a terminal. Also technologies can be used to read SMS and relevant information on behalf of the reader. Will those integrated services improve the uptake of mobile banking among the low literate group of Bangladesh?

Lack of trust was found to be another challenge for m-commerce adoption in Bangladesh. Many participants expressed their dissatisfaction towards the telcos; complaining a range of issues such as poor customer service, unethical business practice, over charging, breach of privacy and confidentiality. It is beyond the scope of the current study to investigate the validity of the allegations. The

objective was to see how those different perceptions and beliefs, grouped under different factors such as risk or trust, affect the user's intention to use m-commerce in Bangladesh. Trust needs to be built up by the telcos to enhance confidence among the users and stakeholders; otherwise the potential growth of m-commerce in Bangladesh will be at risk. Assurance of technological security alone does not build up that trust; it needs professionalism in doing business such as excellent customer service, ethical business practice, reputation etc. When all these are in place, users and stakeholders will be in a position to keep their trust on telcos and that will lead us to achieve the expected goal. Therefore telcos should implement strategic plans and actions to strengthen the consumer's trust on them.

LIMITATION AND FUTURE RESEARCH

There are some limitations of this research, first of all it is not a technical paper and does not deal with the detail technology of Mobile ICT, rather looking at the opportunities and challenges of m-commerce uptake in Bangladesh based on the empirical study and secondary resources. Another limitation is in the sampling. Non probability convenience sampling was used in the study. Although this type of sampling may not represent the whole country accurately, it can be argued that the selection of different sample populations in the current survey was not based on convenience alone, but also on valid reasons and justifications that may lessen the impact of its nonrepresentative nature. Different types of users of m-commerce ranging from high to low were included in the sampling to keep up with the real usage pattern. Two big cities and two rural/semi-rural areas were selected for the purpose of getting various types of m-commerce users from high to low.

Future research could measure the socio economic impact of m-commerce adoption. Analysis of Governmental policies in this field could be a good research work. The author has the plan to build up a model for predicting the influential factors of m-commerce and test it with the data collected in the empirical study. Other relevant research could be to see how RFID, IVR could help illiterate people to adopt mobile banking services.

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