

Adoption Of M-Commerce Services: The Case Of Bangladesh

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This study set out to investigate the high and low adoption usage of M-commerce service categories (Entertainment, transactions, communication, and information). The research focused on whether awareness and knowledge, convenience of Mobile devices and WAP/GPRS enabled handset, pricing and cost, security and privacy, rich and fast information and perceived usefulness have any influence on the intention to use M-commerce services among employed Mobile phone users in Dhaka and Chittagong City of Bangladesh. This study finds that communication category in M-commerce services has higher usage frequency compared to others like entertainment, transactions, and information. Three factors were found to have significant positive influence towards the adoption of M-commerce services are pricing and cost, rich and fast information, and security and privacy. Further, it is interesting to note that there is no significant gender difference in terms of M-commerce adoption level. Users less than 30 years of age have a higher tendency to adopt M-commerce services compare to the older age groups was discovered among employed mobile users in Bangladesh.

Keywords: M-commerce, Adoption level, and M-commerce services.

1.0 INTRODUCTION

The convergence of two of the fastest growing industries, the internet and mobile communication, has led to the creation of an emerging market for mobile commerce (M-commerce). Although the M-commerce market is relatively young, most observers predict that a critical mass of business and individual users will be reached very rapidly.

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An article in business week online reported that International Data Corporation (IDC) has suggested that the market for M-commerce – related services will reach US \$21 billion by 2004 (Baker, 2000). M-commerce contributes with the potential to deliver most of what the internet can offer, plus the advantage of mobility. M-commerce gives mobile communication device such as mobile phones and personal digital assistants (PDA) the ability to pay for goods and services. M-Commerce is difficult to define, and can be interpreted in a variety of ways. This is because M-commerce (also called wireless commerce or mobile e-commerce) is a fairly new phenomenon and several definitions exist. M-commerce defined as “all activities related to a (potential) commercial transaction conducted through communication network that interface with wireless devices” (Shuster, 2001, p.2). A research student from University of Minnesota interestingly defined M-commerce in contrast to these by emphasizing that there are three elements of M-commerce which are a range of activities devices and network types. This leads to his definition of M-commerce as “all electronic transactions (e.g. communication interaction, purchase, payment) that use data- enabled wireless device connection to the internet or to a vendor’s private network” (Angsana, 2002).

However, the real value of M-commerce lies in its ability to realize the tremendous business opportunity and address lifestyle issues prevalent in our context – an aware, hyper-efficient, “on always” world mobile values , or m-value, signifies the value arising from the mobility of the new medium i.e. making use of the internet connection while on the move/road. M-commerce has, in fact, been defined as “e-commerce for users on the move” (Vitter-Pillippe and Navarro, 2000). With the relatively new emergence of M-commerce from the simple service of SMS to mobile payment. Service vendors are cautious of introducing more complex transaction in providing alternative payment service so that it does not oversell its potential for fear that this mode of mobile payment may fall flat on its face and become another technology casualty. Some vendors have rolled out such service to the market on a very small scale and within a somewhat restricted environment. As the mobile commerce industry is still in its infancy, there are many unsolved problems related to its service. One major issue is the development of service which is able to support the diverse array of mobile devices, in addition to multiple networks and provide foolproof security as to allay the fear of consumers. Furthermore, software and interface vary among different suppliers which make it more complex. Nevertheless many industry and technology leaders are addressing these problems and still believe M- commerce has a great potential for the future as the era of wireless and mobility is becoming a trend of this 21st century.

In Bangladesh there is an astonishingly growing number in adoption of wireless technology in the area of M- commerce as there are more consumers have a mobile phone than having a personal computer at home. This is again evident in the figures reported by the Ministry of Finance, Bangladesh that the number of mobile users in

Bangladesh is growing rapidly. However, M-commerce is still relatively new phenomenon compared to other markets in Europe and in Asia Pacific namely Japan, Hong Kong, Taiwan, and Singapore. Most of the companies in Bangladesh are still lagging in providing M-commerce services due to the low rate of penetration of the internet rate in Bangladesh. Therefore this study intended to find out what are factors influencing the adoption of M-commerce among the mobile phone users in Bangladesh.

The remainder of this paper is organized as follows. Section II documents literature review related to M-commerce. Section III describes an overview of telecommunication Industry in Bangladesh. Section IV discusses the data and methodology. Section V presents the empirical results. The paper ends with a brief summary of conclusions.

2.0 Literature Review

M-commerce development started in a very unique way. Although today United States has more PCs per 100 inhabitants compared with many countries, it is far behind between Europe and Asia in respect of cellular phone users (Haque, 2004). Mobile phone which is very popular among Europeans and Asians has caused the transition of e-commerce internet service which is commonly used in PC to the mobile phone device have now been upgraded to do much more than just making a basic phone call. Presently, Europe is expected to lead the mobile markets. The market is more mature as it is penetrated two years earlier compared to other countries; so its number of mobile service is more than others. Besides, the number of overall internet user in Europe is also expected to be equal to the users of USA within few years (Abramson, 2001). Now, Europe leads the USA particularly in M-commerce adoption based on a number of factors includes favorable pricing structure, increasing competition in greater quality of service, and declining costs of network operators (Rao, 2002).

Gartner Dataquest forecasted that the global market for mobile terminal is expected to grow by 18.5 percent in 2004 to 616.4 million. The enhanced phone category is remained the largest segment of the market, accounting for 564.6 million units in 2008 or 74 percent of all sales. Sales of basic phone from 134.7 million units in 2004 to 41.2 million units in 2008. In regions with emerging markets, such as Africa, Asia/ Pacific, Latin America and the Middle-East, growth is expected to continue throughout the forecasted period. Unit sales in Africa will rise at a compounded annual growth rate (CAGA) of 16.2 percent between 2004 and 2008 (Gartner Dataquest 2004). In the Asian scene, Hong Kong has one of the most vibrant mobile telecommunication markets in the world. A high level of mobile penetration rate (over 80%) creates the potential for Hong Kong to be a leader in the development of mobile technologies (Leung Chan and Chan 2003). This does not discount the entire Asia pacific region as it is cited that Japan, Australia, and Singapore are the most ready markets for wireless data in this region. In Taiwan leading mobile phone Company Taiwan cellular corp. invested \$606 million in a mobile commerce portal, which so far included 67 affiliated content providers selling more than 2000 items (Cheng, 2000). A country with four million wireless internet users, Japan I-mode is really big in this country. This is largely because it is cheap, fast and offer access to about 600 official sites and thousands of unofficial site. Users can send

email, transfer funds between bank accounts, book plane ticket see what is playing at the cinema, and find the nearest hotel or restaurant many more service as consumers in Japan are really into M-commerce service. In the future the Chinese giant market will soon catch up due to its 1.2 billion citizens where mobile users are expected to hit 334 million by 2005 according to Gartner.

2.1 M-Commerce Services

Mobile commerce service can be classified according to end user types (provide and business) according to market segment B2C, C2C, B2B. The majority of existing mobile commerce service deal with an exchange of product, service or information between B2C (Panis et al., 2001). These applications include mobile financial service, user and location specific mobile advertising, mobile inventory management, wireless business re-engineering and mobile interactive games. In addition to device and wireless constraints, mobile commerce would also be impacted by the dependability of wireless infrastructure. M-commerce existing and future possible application includes; Mobile banking service (check account information, money transfer), Mobile trade service (stock quotes, selling/buying), Credit card information (account balance), Airline (online reservation, timetable), Travel, Concert ticket reservation, Sales, Entertainment, News / information, Database, application, and Location based application. Since M-commerce is a fairly new phenomenon, several different types of services exist in the academic and practitioner literature and the list is still growing as new service are being recommended. According to Leung, Chan and Chan (2003) in their research on analysis of M-commerce in Hong Kong, M-commerce application are basically divided into three main types as follows;

- a) Purchase of physical goods that requires some kinds of information distribution to complete the transaction.
- b) Purchase of services such as selling and buying stocks.
- c) Information delivery such as news headline and stock market information.

The Mobile Commerce services may be categorized into four main categories: Entertainment (Music, games, graphic, video and TV streaming), Communication (Short messaging, unified messaging, e-mail, chat rooms and video conferencing), Transaction (Banking, broking, shopping, auctions, betting, booking and reservations, mobile wallet, voting, and competition/contests), and Information (News, city guide, directory service, maps, traffic and weather, corporate information, market data and mobile advertising).

2.2 Factors influencing the intention to use M-Commerce Services

Adoption is an individual's decision to become a regular of a product or service. In this paper we explore the factors which influence the intention to use M-commerce service among working employment users in Bangladesh. Most literature in the field lists a couple of common factors in the adoption of M-commerce technology in mobile

computing and some specific in the area of M-commerce service. Some of the factors may overlap as M-commerce service is still dependable on the foundation of M-commerce technology to ensure the service provided meets consumer needs.

Researchers' findings from different countries around the world namely Australia, Finland, Germany, Greece, and Malaysia on adoption of M-commerce from different angles on similar lines are summarized in the following section. Julius and Khasawneh (2003) conducted a study in Australia and found out that low risk, rich information, low cost, social influence awareness and user satisfaction are the influencing factors on adoption of M-commerce services. Haque (2004) finds ease of use, portals and search engines, content with graphics and interactivity, packet switching technology and bandwidth, payment trust and legality, mobile commerce and web enable handsets, non intrusive personalization, timeless, and cost effectiveness are influencing customers in Malaysia on adoption of M-commerce. While Mariga (2003) concluded that perceived usefulness, perceive ease of use, trust, and enjoyment are influencing factors on adoption of M-commerce services. Poo Vern Huei (2004) finds perceived usefulness, perceived ease of use, perceived risk, and cost are the influencing factors on adoption of M-commerce among customers in Penang, Malaysia. Bax and McGill (2002) finds that perceived usefulness, computer self efficacy, computer anxiety, and internet self efficacy are the most important factors on adoption of M-commerce in Finland. Vrechopoukis et al., (2002) in cross country study (Finland, Germany and Greece) finds that ease of use interface, security, customer service awareness, price, and comfort of device influenced the adoption of M-commerce among customers.

3.0 Overview Of Telecommunication Industry In Bangladesh

Currently there are six Mobile Phone operators offering their services to customers in Bangladesh. The total number of mobile phone subscribers has reached 43.7 million at the end of June, 2008 (BTRC, Annual Report 2007-2008). Grameenphone (GP) is the largest and one of the fastest growing cellular service providers in Bangladesh having 20.31 million subscribers. It is owned by Telenor (62%) and Grameen Telecom (38%). Banglalink is to the second largest cellular service provider with 9.46 million subscribers as of April 2008. It is wholly owned subsidiary of Orascom Telecom. Aktel Malaysia International Bangladesh (TIMB) Limited is the 3rd largest cellular service provider with 7.85 million subscribers as of March 2008. It is a joint venture between Telecom Malaysia Sdn Bhd of Malaysia (70%) and a local company A.K. Khan & Company (30%). Warid Telecom International Ltd. is a GSM-based cellular operator in Bangladesh with 3.31 million subscribers making the 4th largest cellular service provider in the country. It is the sixth mobile phone carrier entered in the mobile market of Bangladesh. It is wholly owned subsidiary of Warid Telecom International LLC, which is the part of an Abu Dhabi-based consortium led by His Highness Sheikh Nahayan Mabarak Al Nahayan, a Member of the Royal Family of the Abu Dhabi. There are other two other mobile phone operators in Bangladesh, namely Citycell (1.70 million

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subscribers) and Teletalk Bangladesh Ltd. (1.07 million subscribers). The numbers of Mobile Phone subscribers are shown in Table 1:

Table 1: Comparative scenario of Mobile phone subscribers (Up to April, 2009)

Mobile Operators	No. of Subscribers (in Millions)*
Grameen Phone Ltd. (GP)	20.31
Banglalink	9.46
Aktel	7.85
Citycell	1.70
Teletalk Bangladesh Ltd.	1.07
Warid Telecom International	3.31
Total	43.70

Source: http://www.btrc.gov.bd/btrc/annual_report_07_08_bangla.pdf.

Through a statistics of Bangladesh Telecommunication Regulatory Commission (BTRC) showed on 17 May, 2009 that the total number of Bangladesh's mobile phone subscribers reached 46.50 million at the end of April with an addition of over 1.86 million new users in the first four months of the year 2009. Of the total subscription in January-April period, the BTRC data showed the country's six cell-phone operators added 100,000 in January, 470,000 in February, 540,000 in March, and 750,000 subscribers in April this year. So, the first three largest operators' mobile users i.e. Grameenphone, Banglalink, and Aktel stood at 21.02 million, 10.90 million and 8.83 million respectively in April, 2009. Source: <http://www.tmcnet.com/submit/-number-bangladeshs-mobile-phone-users-reaches-4650-mln-/2009/05/17/4183721.htm>

Based on the value added services offered by these companies while ensuring quality services to the customers, a comparative picture of the M-commerce services offered by the mobile phone companies is given in Table 2:

Table 2: M-commerce services offered by Mobile service providers

Services	Aktel	Banglalink	Citycell	Grameen Phone	Tele Talk	Warid Telecom
FnF (Friends and Family)	Yes	Yes	Yes	Yes	Yes	Yes
SMS	Yes	Yes	Yes	Yes	Yes	Yes
International SMS	Yes	Yes	Yes	Yes	Yes	Yes
Internet SMS	N/A	N/A	N/A	Yes	Yes	N/A
Voice SMS	Yes	Yes	Yes	Yes	Yes	Yes
Voice Mail	Yes	Yes	Yes	Yes	Yes	Yes
Voice Chatting	N/A	Yes	Yes	N/A	N/A	N/A
SMS Chatting	Yes	Yes	N/A	Yes	N/A	N/A
SMS E-mail	Yes	Yes	Yes	Yes	Yes	Yes
GPRS/EDGE Internet	Yes	Yes	Yes	Yes	Yes	Yes
WAP	Yes	Yes	Yes	Yes	Yes	Yes
MMS	Yes	Yes	Yes	Yes	Yes	Yes
Instant Recharging	Yes	Yes	Yes	Yes	Yes	Yes
Call Back Service	N/A	Yes	N/A	Yes	N/A	N/A
Welcome Tunes	Yes	Yes	Yes	Yes	N/A	Yes
Song Dedication	Yes	Yes	Yes	N/A	N/A	N/A
Voice Based Service	Yes	Yes	N/A	Yes	Yes	Yes
Missed Call Alert	Yes	Yes	N/A	Yes	N/A	Yes
Push-Pull Service	Yes	Yes	Yes	Yes	Yes	Yes
Power Menu	Yes	Yes	N/A	N/A	N/A	N/A
International Roaming	Yes	Yes	Yes	Yes	Yes	Yes
Economy ISD	Yes	Yes	Yes	Yes	Yes	Yes
Online Customer Care	Yes	Yes	Yes	Yes	N/A	N/A

4.0 Research Methodology

Information gathered by a number of researchers from the literature review namely Julius and Kahasawneh (2003), Haque (2004), Electronic Commerce Resource Center of Thailand (2002), Vrechopoukis, Adam , Costanton, Foanna , Sideris Ioannis (2002) and Mariga (2003) revealed a number of factors which could impact the successful adoption of M-commerce. However, a comparison of frequent factors used by the above researchers has been selected to narrow down the most common factors which are critical for all the previous research as a base to only 5 important factors. They are Awareness and knowledge, comfort of mobile devices and WAP/GPRS enable pricing and cost, Security and Privacy, Rich and Fast information. Furthermore, one of the independent variables Perceived Usefulness is added into the theoretical framework. It is adopted from the Technology Acceptance Model. Davis (1989), and Bax and McGill (2002) used Perceived Usefulness as one of the factors on Web Application of Mobile Computing. Self Efficiency is selected as the moderating variable based from the researches done by Rosa, Marisa and Jose Maria (2001) where it plays an important role in affecting motivation and behavior. For the present study, the focus is on the

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factors influencing the adoption of M-commerce services among employed mobile phone users in Bangladesh.

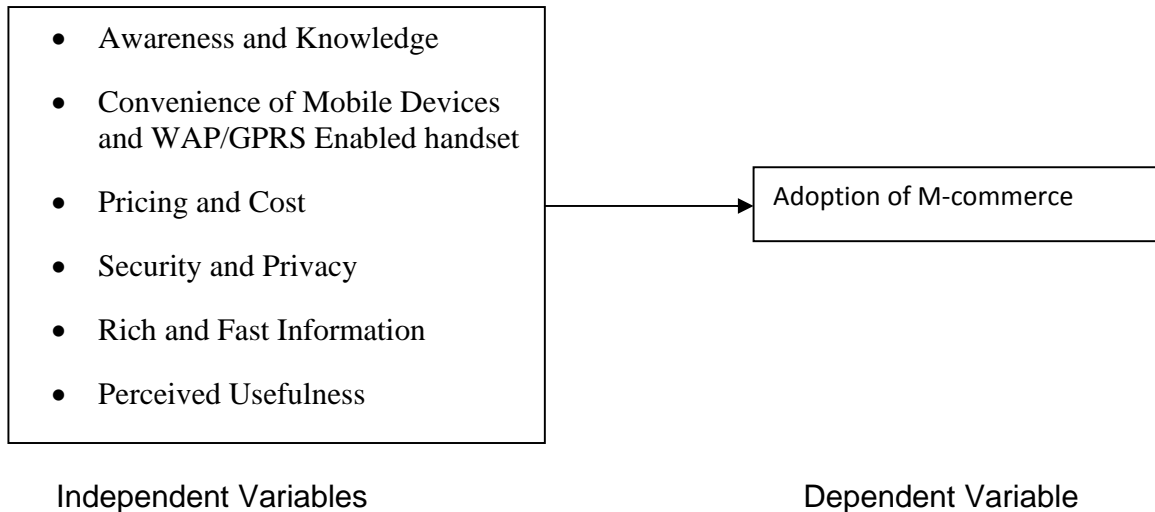


Figure 1: Schematic diagram of the theoretical framework.

From the theoretical framework the following hypothesis were generated for this study. The goal is to confirm the relationship between the critical success factors of Awareness and Knowledge, Convenience of mobile devices and WAP/GPRS enabled handset, Pricing and Cost, Security and Privacy, Rich and Fast information. In addition to role Perceived Usefulness towards the success of adoption of M-commerce services is also considered.

Hence, the hypotheses proposed are:

Hypothesis1: Consumers with a high Awareness and knowledge of M-commerce services will be more likely to adopt M-commerce service.

Tang and Veijalainen (2001), assert that the main force for rapid acceptance rate of M-commerce is its increasing convenience and efficiency in performing simple transactions compared with the stationary machines. However, the comfort level of using the input mechanisms, screen resolution, and screen size of the mobile phones are critical physical make up of the mobile phone which makes it easier for the user to navigate and perform any M-commerce transaction. In addition having WAP/GPRS enable in the mobile phone plays a critical role in enabling M-commerce applications.

Hypothesis2: Convenience of mobile devices and WAP/GPRS enabled handset will increase the likelihood of consumers to adopt M-commerce service.

Heinonen, Kristina (2002) conducted a study on acceptance of mobile services shares that pricing issues appeared as one of the most engaging factors hindering the use of mobile services. The research found among Swedish market that prices were too high, especially when comparing the price internationally. The investments made in

technology of 3G are also a major concern where consumers did not see the benefits in them and felt that they were unreasonable.

Hypothesis 3: The lower the cost and pricing of using M-commerce service the more likely that the services will be adopted.

In a research done by Gartner, Liew (2001) from an interview with Foong King Yer, an analyst with Gartner it was found that there is still a lack of wireless security standard and practices which in the short term could inhibit the rapid adoption of M-commerce in the region.

Hypothesis 4: The lower perceived risk from security issues of using mobile commerce services the more likely this service will be adopted.

Jellbert, Julias and Ahmad, Khasawneh (2003) shares that minimal textual display on the mobile devices is one of the reasons that can lead to the introduction of other inhibitor to M-commerce adoption. Furthermore, speed and timeliness of getting the information is also important for users to adopt M-commerce services.

Hypothesis 5: Rich and Fast information is more likely to increase the adoption of M-commerce services among consumers.

The Technology Acceptance Model (TAM) is one of the most influential extensions of Ajzen and Fishber's Theory of Reasoned Actions (TRA) in the information system literature. TAM used the generic Fishbein and Ajzen's TRA model (Fishbein & Ajzen, 1975) to the particular domain of user acceptance of computer technology, replacing the TRA's attitudinal determinants with two specific behavioral beliefs: perceived ease of use and Perceived Usefulness in a technology acceptance measures. Perceived Usefulness is defined as "the degree to which a person believes that using a particular system would enhance his or her productivity" (Davis, 1989, page 320). In a research done by Poo Vern Huei (2004), with regards to users' acceptance of wireless computing devices among consumers in Penang that Perceived Usefulness has shown significant positive relationship against the acceptance of the wireless computing devices. This factor was also used by researchers Bax and McGill (2002) in their study on Web Application on Mobile Computing, where Perceived Usefulness was used as an independent variable. These results suggested that the individual who perceived the wireless computing devices were useful tend to accept the wireless computing devices.

Hypothesis 6: The Perceived Usefulness in M-commerce services has a significant influence in the adoption of M-commerce services.

4.1 Data Collection and Construct Measurement

The objective is to examine the relationship between critical success factors influence in adoption of M-commerce services among employed mobile phone users in Bangladesh. The primary source of data is by survey questionnaire. It was administered to various working segments industry in Dhaka and Chittagong, the major two cities of Bangladesh. Primary means of distribution is via hardcopy delivery of survey

questionnaire and distribution was based on the random sampling. The questionnaires were distributed after pre-contacting or meeting the recipients and informing them on the objective of the survey. About 210 questionnaires sets were distributed among employed mobile phone users and collected over a three weeks time period. The questionnaire set was developed from earlier work by Loh (2004). It was adapted to suit an audience more familiar with the actual situation in Bangladesh. Initial pilot testing was performed on a limited audience to verify that the modifications do not adversely affect the validity of the questionnaires. Pilot testing is recommended to avoid errors and improve the legitimacy of the data. A total of 40 responses were received for the pilot test and it was deemed sufficient to proceed, through minimum recommendations (Saunders, Lewis and Thornhill, 2000).

5.0 Results

A total of 210 questionnaires were distributed based on the convenient sampling. Out of 210 questionnaires distributed, 105 were collected from the respondents and the rest of 5 sets were rejected as they were not fully answered. The 100 sets that make up 47.61% of the data were analyzed using the Statistical Package for Social Sciences (SPSS) software. The respondent age group show 4 (4%) comes from age 20 years and below, 42(42%) which is the highest majority comes from 21-30 year old, followed by 34 (34%) from the age 31-40 years old, 14 (14%) from the age of 41-50 and 6 (6%) from age 51 years and above. Respondents education level show at 11 (11%) Secondary level, 28 (28%) Diploma level, 54 (54%) Degree level, 6 (6%) from Masters level and 1 (1%) from PhD level. In terms of occupation field, 21 (21%) are from Garments, 26 (26%) from Education, 17 (17%) from Wholesale and Retail, 20 (20%) from Hotel and Restaurant, 7 (7%) from Printing and Communication, 4 (4%) from Public Administration, and 5 (5%), Health and Medical services.

5.1 Reliability Analysis

Table 3 below shows the number of items for each independent variable; Awareness and knowledge, Convenience of mobile devices and WAP/GPRS enabled, Pricing and Cost, Security and Privacy, Rich and Fast information and Perceived Usefulness, and Adoption as the dependent variable; and the Cronbach Alpha value for each variable.

Table 3: Summary of reliability analysis

Variables	Number of items	Number of items deleted	Cronbach Alpha
Awareness and Knowledge	5	None	0.7452
Convenience of Mobile Devices and WAP/GPRS enabled	5	None	0.8790
Pricing and Cost	5	None	0.7699
Security and Privacy	5	None	0.7663
Rich and Fast information	5	None	0.7046
Perceived Usefulness	5	None	0.8541
Adoption	5	None	0.7199

To assess the internal consistency and stability of data, the reliability analysis measures how the items in each set correlate with one another. Cronbach's Alpha was used to establish this inter-item consistency. There were five items proposed to evaluate the variable Convenience of mobile devices and WAP/GPRS enabled and this yielded an Alpha value of 0.8790. Similarly, Security and privacy had five items and a resulting Alpha value of 0.7663. To evaluate Rich and Fast information another five items were proposed yielding a final Alpha value of 0.7046. For the five items representing Perceived Usefulness, the Alpha value was found to be 0.8541 and for Pricing and Cost yielding a final Alpha value of 0.7699. For Awareness and Knowledge five items were proposed yielding a final alpha value of 0.7452 making this independent variable having the lowest Cronbach Alpha value, however the Alpha value as found to be above 0.5 and is thus considered to be reliable. For the dependable variable of adoption, 5 items were proposed and this resulted in a Cronbach Alpha value of 0.7199. Again this is a statistically reliable result.

5.2 Factors Affecting M-commerce Adoption

Regression Analysis was carried out to test the relationship between the dimensions of Awareness and Knowledge, Convenience of mobile devices and WAP/GPRS enabled handset, Pricing and Cost, Security and Privacy, Rich and Fast information and Perceived Usefulness on the adoption of M-commerce. As in previous accepted studies of this nature, only a significant level of 0.05 or 5% significance is used as a basis for accepting or rejecting the hypothesis. The regression model involves Awareness and Knowledge, Convenience of mobile devices and WAP/GPRS enabled, Pricing and Cost, Security and Privacy, Rich and Fast information and Perceived usefulness as independent variables and adoption of M-commerce as the dependent variable.

From regression table, the coefficient of R^2 is 0.430 indicating that all the independent variables account for 46.7% of the variance in adoption of M-commerce. Durbin Watson of 2.010 indicates there is no auto-correlation problem. Tolerance and VIF values within

the acceptable range for all independent variables indicate there are no multicollinearity problems.

Table 4: Regression Analysis output

Variables	Beta	t-values	Significance
Awareness and Knowledge	0.098	2.619	0.295
Convenience of Mobile Devices and WAP/GPRS enabled	0.103	1.033	0.304
Pricing and Cost	0.321	3.428	0.001*
Security and Privacy	0.205	2.033	0.045*
Rich and Fast information	0.263	2.745	0.007*
Perceived Usefulness	-0.100	-1.003	0.318

$R^2 = 0.430$ Sig. = 0.000
 F-Value = 11.698 Durbin Watson = 1.5 < 2.010 < 2.5
 Tolerance = < 1 VIF = < 10

The findings of the coefficient matrix prompt rejection of Hypothesis 1, 2, and 6; and acceptance of Hypothesis 3, 4 and 5. It shows that Awareness and Knowledge (p value =0.295), Convenience of Mobile devices and WAP/GPRS enabled (p value. = 0.304) and perceived usefulness (p value =0.318) are not related to factors significant enough in terms of adoption of M-commerce. Pricing and cost (p value = 0.001), Rich and Fast information (p value = 0.007) and Security and Privacy (p value = 0.045) have a very strong impact on the factors impacting the adoption of M-commerce.

T-test was used to determine if there is any significant difference between genders towards adoption of M-commerce. The Levene’s test for gender (t = 0.240, p = 0.811) implies that there is no significant difference in the level of adoption between male and female employed mobile phone users in Bangladesh. However, male gender exhibited higher mean results of 2.9241 comparing to the female gender (2.8857). One Way ANOVA was used to find out whether age group has a significant difference with each grouping towards the adoption of M-commerce. One-way Anova was run to find out whether categories in a variable differ in respect to adoption of M-commerce. For age, the F statistic was significant (P = 0.007), meaning age category does have significant different with each age group towards adoption of M-commerce. This finding generally explains that the young working employment group of age 30 and below tends to adopt M-commerce trends compared to the older generation of working employment group in Bangladesh.

6.0 Discussion

The purpose of this research is to investigate the high and low adoption usage of M-commerce services categories (Entertainment, Transactions, Communication, and Information) among employed mobile-phone users in Bangladesh. Furthermore, to study the factors influencing the adoption of M-commerce services especially among the employed mobile users in Bangladesh. We studied factors influencing the adoption

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of M-commerce researched by various authors (Julias and Khasawneh, 2003; Haque, 2004; Electronic Commerce Resource Center of Thailand, 2002; Vrechopoukis, Adam , Costanton, Foanna , and Sideris, Ioannis., 2002; Mariga, 2003 and Poo Vern Huei, 2004). The factors influencing the adoption of M-commerce selected for study were Awareness and Knowledge, Convenience of mobile devices, WAP/GPRS enabled handset, Pricing and Cost, Security and Privacy, Rich and Fast information, and Perceived Usefulness. It is believed that these factors would influence the adoption of M-commerce services. Finally, the research encompassed the gender impact of adoption which was based on research done by Saljoughi, Farhad (2002).

The first research area of investigation was the high and low adoption usage of M-commerce services categories (Entertainment, Transactions, Communication, and Information) among working employment mobile phone users today in Bangladesh. The researchers found that for usage with up to 5 times a week and above, 74% is for communication, 10% for Information, 7% for Entertainment, and only 3% for Transactions. SMS which stands for Short Message Service, one of M-commerce Communication services has recently a three-fold increased in penetration in Bangladesh since 2003 onwards. Transaction periodically seems to be low for several years now which could be true, despite its benefits it has generally seen very low uptake around the world. Thus the general findings of the high and low adoption usage of M-commerce services are valid in the context of M-commerce service usage penetration in Bangladesh.

The degree of Awareness and Knowledge was not related as a critical factor to the adoption of M-commerce services in Bangladesh. This finding is contrary to findings of various authors (Julias and Khasawneh, 2003; Electronic Commerce Resource Center of Thailand, 2002; Vrechopoukis, Adam , Costanton, Foanna , and Sideris, Ioannis., 2002) and the proposition is validated through Philip Kotler (2002) who states adopters of new products have been observed to move through five stages which are awareness, interest, evaluation, trial, and adoption. Awareness could encompass marketing and education in relation to the product, peer influence which creates the awareness, customer services provided by the company to educate users and consumer self-learning in attaining the knowledge. However, Awareness and Knowledge of M-commerce services is not an important factor in the context of adoption of M-commerce services among employed mobile phone users in Bangladesh. A significant finding of this study is that Convenience of Device and WAP/GPRS enabled do not have a significant impact towards the adoption of M-commerce services in this context. This partially contradicts studies by various authors (Haque, 2004; Electronic Commerce Resource Center of Thailand., 2002; Vrechopoukis, Adam , Costanton, Foanna, and Sideris, Ioannis., 2002) who consistently cite Convenience of device and WAP/GPRS enabled is a key factor of adoption. It might be a factor but it is not so significant in the findings of this study. Most of the researchers share this factor as a main force to increase convenience and efficiency in performing simple transactions and receiving high frequency data download which is more connected to M-commerce services categories in the area of Entertainment, Transaction, and Information (Tang and Veijalainen, 2001).

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The result of this study suggests that Pricing and Cost is a significant factor in adoption of M-commerce services. This supports several previous findings (Julius and Khasawneh, 2003; Haque, 2004; Electronic Commerce Resource Center of Thailand, 2002; Vrechopoukis, Adam, Costanton, Foanna, and Sideries, Ioannis, 2002). Researchers have found that Pricing and Cost is the highest or commonly used factor to determine the adoption of M-commerce services. However, in this context environment, it is likely that in penetration of M-commerce services which demands higher payment for complex services in the area of Entertainment, Information, and Transaction is still in an infant stage in the market. M-commerce service in the area of Communication is highly adopted and the pricing is an important factor since employed mobile phone users know it is a vital tool as part of today's working needs and lifestyle. This study suggests that Security and Privacy is a significant factor in adoption of M-commerce services. This is supported by various researchers (Julius and Khasawneh., 2003; Haque, 2004; Vrechopoukis, Adam, Costanton, Foanna, and Sideries, Ioannis., 2002; Mariga, 2003; Poo Vern Huei, 2004). Security and Privacy is significant in adoption of M-commerce. Usage of M-commerce services, in the areas where Security and Privacy is very critical for example Information and Transaction, is still in an infant stage of penetration in the study market. M-commerce service in the area of communication is highly adopted and consumer have begun to trust the technology and thus security is a significantly important factor when it comes to communication in M-commerce as long as the information is being transferred fast, timely, and accurate.

Rich and First information is found to be strongly correlated as a critical factor in adoption of M-commerce services. This supports findings by Julius and Khasawneh, 2003; Electronic Commerce Resource Center of Thailand, 2002; Haque, 2004; Anckar and Divide,. 2002. Rich and Fast information in the form of business information, news or finance alert, is really helpful for today's employed mobile phone users. This gives working professionals an edge in their very busy schedule. The information needed has to be fast and timely. Rich information and speed are key ingredients to spur the working professionals of today and tomorrow to adopt M-commerce services as part of their lifestyle. Perceived Usefulness was not found to be an important factor in influencing people in adopting M-commerce services. This contradicts the findings by Julius and Khasawneh., 2003; Mariga, Julie, 2003; Poo Vern Huei,. 2004; Saga & Zmud. 1984; and is likely to be a highly controversial finding. Perceived Usefulness is significant but the findings in this study do not show its importance yet. This may due to the fact that the level of penetration of M-commerce services in the study market is still in its beginning stage. Employed mobile phone users who perceived the usefulness of M-commerce services will continue to explore and slowly adopt its services. They will use its technology as they strongly believe it is useful and will help enhance their working lifestyle.

An interesting finding found in this research is that there is no significant difference in the adoption between male and female. There is a slight mean difference where men tend to treat adoption of M-commerce as important but is not significant enough to reflect the difference. This contradicts the research done by Saljoughi, Farhad (2002), with regards to adoption of M-commerce in a global perspective. It was found based on

gender that there is a much larger number of men respondent compared to women. Based on the research done in 2002 which was conducted three years later, this research show that women have significantly picked up the adoption of new technology and moving to close the gap but we need also to realize the researcher narrowed the scope of sampling to the population of Bangladesh compared to Saljourhi, Farhad's (2002) research. This may be mainly due to the continuously growing market of mobile phone users and M-commerce growth in the country of Bangladesh especially in the area of M-commerce communication services where gender does not play a significant role. Further interesting findings were found in the area of age as the researcher explores the statistical data. It was found that age groups have a significant differentiation towards the adoption of M-commerce services. The data show that working employment age group 30 and below tends to adopt M-commerce trends compared to the older generations of working employment group in Bangladesh.

7.0 Conclusion

Based on the results, some tentative implications can be made. Firstly, these employed mobile phone users clearly shows that their usage of specific mobile services is mainly limited to Communication services which is higher compared to other mobile services like Entertainment, Transactions and Information. Also Pricing and Cost, Security and Privacy; Rich and Fast information are key significant factors which influence the adoption. Three out of six hypotheses were accepted and these are: pricing and cost, security and privacy, and rich and fast information. Three hypotheses were rejected and these are: awareness and knowledge, Convenience of Mobile Devices and WAP/GPRS enabled, and perceived usefulness. It can be assumed that for services with clearly defined market like the Communication M-commerce services, a market pull strategy might be easier to pursue rather than an invention push strategy. Consumers can more easily be a source for ideas as they are available and ready to express their needs. The present study gives some key implications in terms of how to increase the adoptions of mobile services. This can be done by (1) disseminating knowledge about mobile services, (2) improving and extending the existing mobile services (3) increasing employed mobile phone users. Improving and extending existing mobile services is also important. Telco companies should continue to improve the Communication Services category and find breakthrough to enhance this highly usage category services. At the same time continue to emphasis the usability of other mobile services. By demonstrating the linkage to other supplementary channels e.g. Internet, the benefits of mobile services will be seen to be enhanced with more customers using the Internet and mobile devices continue to evolve, the complementarity of the channels would thus be an interesting research agenda.

Finally, extending and expanding working employment usage among the community of Dhaka and Chittagong is very important to create the exposure and trigger more adoption of M-commerce services. This is in line with research about the role of new consumers which states that consumers value social and involved consumption (Lewis and Bridger, 2000). Interestingly, consumers want to be accepted by their community and want to feel that they belong to the group. Thus, it is important that the community

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creates and maintains clear purpose and meaning. This will create an opportunity in term of developing services around a specific and distinct issue that a community can be interested in. One example could be a Business Club where working employment professionals of certain category receives M-commerce services of all categories which are tailor-made to this group of community of working professionals, for example: jobs, market, finance information etc. By using both the Internet and mobile device, the consumers can interact with each other and simultaneously create and motivate usage among the community in Bangladesh.

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