

The impact of the Formation Factor of Loyalty Of Mongolian Consumers Attitudes toward M-Commerce

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Abstract

Recently in the Mongolian wireless marketplace, many E-commerce companies have been making considerable investments in the technological development of M-commerce, taking competitive advantage of new business possibilities offered by Internet-based wireless technologies.

In the Mongolian wireless marketplace, this new mobile environment opens the door for new and exciting market opportunities in mobile services and applications.

In the near future, these companies will be looking toward M-commerce services as a supplemental source of revenue in the mobile marketplace.

This paper examines the roles of M-commerce in the consumers' in order to promote the consumers' loyalty in the booming M-commerce.

This paper contains theory that focuses on the basic concepts of the M-commerce environment, its wireless network technologies, and its applications infrastructure. Upon searching for references to assist us in establishing a market hypothesis, we discovered that few comprehensive studies on consumer perspective and behavior related to M-commerce services actually exist in the literature.

In the area of M-commerce, many companies neglect the consumer perspective, concentrating only on technological factors only when formulating their market strategies. And, due to technological blindness, many companies were not able to succeed in end-user E-commerce services. Given that fact, this paper formulates a consumer-centric research model.

In order to prove the research model, we chose the survey method which allows for the collection of large amounts of data from a sizeable population in a highly economical way. Through the survey, this paper defines consumer's attitudes towards M-commerce services by identifying potential Business-

to-Commerce(B2C) applications and its primary target groups in terms of gender and age, and by investigating whether consumers recognize the value proposition of M-commerce applications and services.

As shown in the data analysis and results, this research concludes that M-commerce development in Mongolia is still at its infancy, and that the implementation of M-commerce depends not only on technological progress, but also on consumer attitudes and their willingness to adopt M-commerce services. As well, other complex cross-cultural factors-socially, economically, culturally, et cetera-enter strongly into the equation.

1. Introduction

1.1 Background and Objectives of the Study

M-commerce, a new form of electronic commerce, was brought on by the rapid growth of wireless communications. It is defined as the buying and selling of goods and services using wireless handheld devices, including monetary transactions enabled by wireless networks and devices. It also includes business-related communications among individuals and companies where financial transactions do not necessarily occur. [2]

The convergence of wireless technology and the internet has produced a tremendous amount of market opportunity in the development of M-commerce.

In fact, since the vast proliferation of WWW-based B2C E-commerce in 1995, M-commerce has become a strong point of interest. WAP was developed by the Wapforum founded in 1997, with an aim at

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developing wireless Internet-like standards for digital wireless networks.

M-commerce has the following features that are unavailable in traditional E-commerce: [6]

1. **Ubiquity:** Through mobile devices, business entities are able to reach customers anywhere and at anytime. Users can also get any information they are interested in, whenever they want, regardless of where they are, through internet-enabled mobile devices. In this sense, M-commerce allows for a service or application to be available wherever and whenever the need arises.
2. **Personalization:** An enormous amount of information, services, and applications are currently available on the ability to retrieve information users receive is of great importance. Since owners of mobile devices often require different sets of applications and services, mobile commerce applications can be personalized to represent information in order to provide differentiated services unique to each user.
3. **Flexibility:** Because mobile devices are inherently portable, mobile users may be engaged in other activities, like, for example, meeting people or traveling, while conducting transactions or receiving information through their Internet-enabled mobile devices.
4. **Localization:** Some wireless infrastructures support simultaneous delivery of data to all mobile users within a specific geographical region. This functionality offers an efficient means to disseminate information to a large consumer population. In the Mongolian marketplace, this new mobile environment opens the door for new and exciting market opportunities in mobile services and applications and new streams of revenue. As the development of M-commerce in Mongolia is still at its infancy, the implementation of M-commerce depends not only on technological progress.

2. Literature Review

2.1 The Definition of M-commerce

M-commerce is a new form of electronic commerce brought on by the rapid growth of wireless communications. The most common definition of M-commerce is the buying and selling of goods and services using wireless handheld devices such as mobile telephones or personal data assistants (PDAs), it can also include monetary transactions enabled by wireless networks and devices. However, a broader definition that expands the scope of M-commerce as a “mobile business” may be more appropriate. This broader definition involves business-related communication among individuals and companies where financial transactions do not necessarily occur. [2]

2.1.1 Main Driving Forces of M-commerce

At present, mobile communication is driven by a variety of factors (Figure. 1):

Firstly, there are social development trends. M-commerce involves the application of the Evernet idea, the possibility of communicating privately or for business anytime and anywhere (Friedman, 1999). This ubiquity represents a value that explains the high willingness of consumers to pay for mobile communication (Meissner and Poppen, 2000).

Secondly, there are transmission technology-related driving factors. Not only will we experience voice transmission of a quality comparable to a fixed line, we will also have mobile access to the Internet and to other Internet Protocol (IP)-based services and applications. With frequency assignments as well as the appointment of global wavebands, the prerequisites for market growth, competition and global roaming have already been created.

Thirdly, there are economic drivers. Positive network externalities, attractive content, low costs and reasonable prices for mobile services, substitution possibilities and other factors are all making substantial contributions to market growth.

2.1.2 Main Features of M-commerce

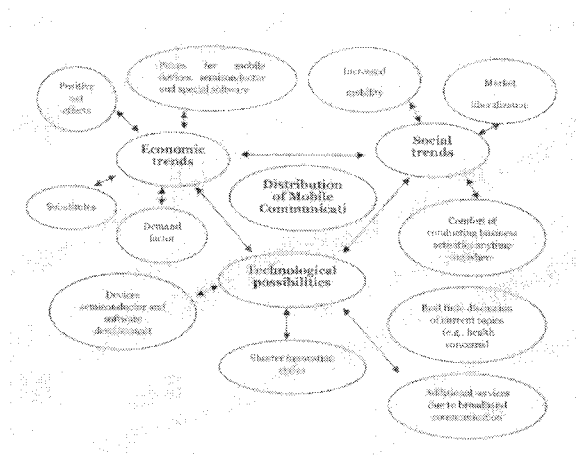


Figure 1. Drivers for Mobile Communication

M-commerce operates partially in a different environment than E-commerce which is conducted in the fixed Internet, due to its special characteristics, the constraints of mobile terminals and wireless networks, and the contexts, situations and circumstances in which people use their hand-held terminals. Most notably, location-based products and services is a completely new business, both technically and in legal terms, and is typical of M-commerce.

2.1.3 Limitations of M-commerce

Several limitations about the spread of M-commerce development are outlined below. [3]

2.1.3.1 The Usability Problem

When mobile Internet users visit mobile Internet sites, the usability of the site is critical to attracting their attention and retaining user stickiness. There are three dimensions to usability, namely, effectiveness, efficiency, and satisfaction. However, users find current mobile devices to be ineffective, particularly with respect to restricted keyboards and pocket-size screens, both of which limit their usability.

2.1.3.2 Technical Limitations

The following are some technical limitations in the spread of M-commerce:

- **Lack of a Standardized Security Protocol:** There is no consensus or Standardization of security methodologies that must be incorporated into all mobile-enabled web sites.
- **Insufficient Bandwidth:** A shortage of bandwidth limits the extent to which mobility can be viewed as a commodity. This situation will exist until the global Introduction of 3G
- **3G licenses:** The implementation of 3G technology is only one of the issues related to next generation wireless.
- **Transmission and Power Consumption Limitations:** Depending on the media used, users of mobile devices may experience multi-path interference, weather and terrain problems, and distance-limited connections.
 - **WAP limitations**
 - **Speed:** Connections to WAP sites are still too slow. In addition it takes too long for a WAP site to build a screen. As Internet experience shows, most users abandon websites that take too long to load.
 - **Cost:** Fees for mobile phone users are still too high for widespread Adoption of M-commerce.
 - **Accessibility:** A WAP phone is only able to access sites that are written in WML

2.1.3.3 Potential Health Hazards

The issue of cellular radio frequency emissions and the fear that radiation from wireless mobile devices may induce cancer has been debated for several years. As of 2002, there is no conclusive evidence that links radiation from wireless devices with cancer (Rapid Interagency Committee, 2001). In the meantime, the public is advised to adopt a precautionary approach to using mobile phones (e.g., using an earphone device that keeps the phone's antenna away from the user's head).

2.2 M-commerce Applications and Services

M-commerce is not merely a variation on existing Internet services; it is a natural extension of E-business. Mobile devices create an opportunity to deliver new services to existing customers and to attract new ones.

Table 1 Classes of M-commerce Applications and Services²

Classes of M-commerce Applications	
Class of Applications	Examples of Services
1. Mobile financial applications(B2C, B2B)	Banking, brokerage, and payments for mobile users
2. Mobile advertising(B2C)	Sending user-specific and location-sensitive advertisements to users
3. Mobile inventory management (B2C, B2B)	Location tracking of goods, boxes, troops, and people
4. Proactive service management (B2C, B2B)	Transmission of information related to distributing components to vendors
5. Product locating and shopping (B2C, B2B)	Locating/ordering certain items from a mobile device
6. Wireless reengineering(B2C, B2B)	Improvement of business services
7. Mobile auction or reverse auction (B2C)	Services for customers to buy or sell certain items
8. Mobile entertainment services (B2C)	Video on demand and other services to a mobile user
9. Mobile office(B2C)	Working from traffic jams, airports, and conferences
10. Mobile distance education(B2C)	Taking a class using streaming audio and video
11. Wireless data center(B2C, B2B)	Information can be downloaded by mobile users/vendors
12. Mobile music/music-on-demand(B2C)	Downloading and playing music using a mobile device

2.2.1 Mobile Technology Application Infrastructure

With the arrival of a wide range of technologies such as WAP, i-mode, Bluetooth, GPRS and 3G, wireless LANs, smart phones, speech recognition and accurate location services, a revolution in mobile technology appears to be in the making. With wireless connection distances between mobile devices ranging from a few meters and beyond, wireless networks have the potential to become pervasive. Though most current networking technologies operate independently, they will become more interoperable

in the near future. By applying intelligent networking applications(such as Jini and Bluetooth), mobile devices will have the ability to interact with many other devices including ATMs, mobile phone PDAs, cameras, MP3 players, set top boxes, consumer electronics and conventional computers. Two key wireless applications that could revolutionize the wireless Internet into an “always-on” experience are Bluetooth and WAP. Bluetooth was conceived as a cable replacement technology to enable data synchronization between a personal digital assistant (PDA) and mobile phone. Wireless Application Protocol (WAP) is the global on standard that emerged from competing mobile Internet access technologies.

A web server channels Hyper Text Mark-up Language (HTML) coded information to a WAP proxy on the wireless network that filters the information down into WML (Wireless Mark-up Language) and then channels it to the mobile handset. WML responses from the mobile handset are passed back through the WAP proxy and sent onto the web server as HTML.

3. Findings from a National Consumer Survey

3.1 Business case Study in Mongolian Consumer Market

3.1.1 Data Collection

Data were collected from 700 consumers in Ulaanbaatar city, and 350 Non-interactive self-administered questionnaires were distributed to both cellular operator companies during July 2004.

A total of 650 samples were collected during July 2004, with 590 questionnaires deemed usable, giving an effective response rate of 40%. The corresponding sample was manually checked for possible non-response error on a number of variables such as age group, gender, usage service area, mobile internet and WAP usage area.

In the questionnaire, the respondents were asked to indicate the likelihood that they would use different mobile services and their importance as a supplemental tool of revenue.

Their answers were judged using a 2 point scale: 1=yes, 2=no; a 5 point scale: 1=very good, 2=good, 3= I don't know, 4=bad, 5=very bad, 1=very important, 2=important, 3=less important,

4=unimportant, 5=I don't know; and on a 4-point scale: 1=very high, 2=high, 3=normal, 4=low.

3.1.2 Data Analysis and Results

Of the respondents, 263 (44.6%) were males, 319 (54.1%) females. All age groups were represented in the following proportions of age: 19-25 (49%), 26-35 (29.8%), 36-45 (14.1%), 46-60 (5.6%). Among the respondents, 284 (48.1%) were GSM users and 306 (51.9%) were CDMA users. While 348 (58.9%) were prepaid users and 242 (41.1%) postpaid users. As well, 60.7% were regular fixed Internet users, 37.8% non-users or they didn't know about the Internet. Further, 62.2% of respondents owned a WAP-enabled handset, 14.4% a non-enabled handset, and 19% answered they were unfamiliar with WAP. Here, only 309 (52.4%) respondents were users of mobile services, while 281 (47.6%) were non-users. Given these results, we should deliberate on why there was such a low percentage of an effective response rate among respondents.

Table 5 Mobile Service Adopters' Willingness of All Respondents (N=309)

In general, the result in Table 5 showed a very low willingness among mobile service-adopters to use the suggested services.

For M-service non-adopters in Table 6, the results

Mobile Service	Mean	Interest	Median	SD
1. Send/receive emails	.21	21.4%	.00	.41
2. Listen to/download music	.32	32.4%	.00	.47
3. Downloading pictures and melodies	.38	38.1%	.00	.49
4. Routine bank services	.17	16.97%	.00	.38
5. Foreign currency rate	.26	26.1%	.00	.44
6. Horoscopes	.23	23.2%	.00	.42
7. Weather news	.18	17.8%	.00	.38
8. Send messages from the Internet to the handset	.13	12.9%	.00	.34
9. Online chatting with strangers	.11	11.4%	.00	.32
10. Book cinema/theatre tickets	.07	7.3%	.00	.26
11. Book travel tickets	.08	8%	.00	.27
12. Restaurant reservations	.09	9.3%	.00	.29
13. Play online games	.13	13.4%	.00	.34
14. Calendaring and alerting	.1	9.8%	.00	.30
15. Buy products online	.08	8.6%	.00	.28
16. Play lotto games	.1	10.2%	.00	.30
17. Remote activation of home appliances	.21	20.5%	.00	.40
18. Dictionary	.22	22.0%	.00	.41
19. Multimedia messages(MMS)				

showed a rather low willingness to use the suggested M-services when compared to M-service adopters. Among non-adopters, respondents indicated a rather high willingness to use M-mail, multimedia messages, listen to/download music, and dictionary services.

Table 6 Mobile Service Non-adopters' Willingness of All Respondents (N=281)

Mobile Service	Mean	Interest	Median	SD
1. Send/receive emails	.12	12.4%	.00	.33
2. Listen to/download music	.11	10.8%	.00	.31
3. Downloading pictures and melodies	.09	8.8%	.00	.28
4. Routine bank services	.06	5.6%	.00	.23
5. Foreign currency rate	.07	7.1%	.00	.26
6. Horoscopes	.08	8.3%	.00	.28
7. Weather news	.08	8.3%	.00	.28
8. Send messages from the Internet to the handset	.06	6.4%	.00	.25
9. Online chatting with strangers	.03	3.4%	.00	.18
10. Book cinema/theatre tickets	.05	5.6%	.00	.23
11. Book travel tickets	.05	5.1%	.00	.22
12. Restaurant reservations	.05	5.4%	.00	.24
13. Play online games	.05	5.1%	.00	.22
14. Calendaring and alerting	.08	8.1%	.00	.27
15. Buy products online	.07	7.3%	.00	.26
16. Play lotto games	.04	4.1%	.00	.20
17. Remote activation of home appliances	.09	8.8%	.00	.28
18. Dictionary	.08	8.5%	.00	.28
19. Multimedia messages(MMS)	.12	12%	.00	.33

4. Conclusion

4.1 Discussion and Implications

This paper highlights the importance of adopting a consumer-centric approach when developing M-commerce strategies. In order to support business decision-making, investment decisions and the development of purposeful mobile services, an understanding of the elements and special features of

wireless environments that are value-adding from the consumers' point of view needs to be built. In the third part of research objectives, this paper aims to investigate whether consumers recognize the value proposition of M-commerce applications and services as a supplemental source of revenue.

This paper do not support this speculation due to non-response rate of the vast majority of respondents to this question. In this paper, we try to compare our results with other developed countries research results such as Korea and Finland. We found that there is a big gap of research results between developing and developed countries. Therefore, we excluded the comparison from the developed countries results.

This paper implies that the internet and wireless handheld devices are encouraging the adoption and use of M-commerce applications and services among consumers.

4.2 Summary and Contributions

As shown in the data analysis and results, we conclude that there is very low willingness to use the suggested M-services both in the case of M-service adopters and non-adopters. Although the results indicated a very low willingness to use suggested M-services, they also showed a relatively high willingness to use M-mail, multimedia messages, listen to/download music and melodies, horoscopes, and dictionary services, and a relatively low willingness to play on-line games, book travel tickets, make restaurant reservations, and chat online with strangers. Finally, M-commerce is a very complex area of research due to the lack of printed journal literature in this area. However, it is also a very exciting area because innovations re happening in the marketplace daily, making it one of the leading edges of technology.

This paper contributes a clear theoretical understanding of M-commerce and its unique features, and introduces an empirical survey result conducted in the Mongolian consumer market as an example of the current development of M-commerce from a consumer viewpoint. As well, this research provides

an effective means for decreasing the existing M-commerce development gap among different players.

4.3 Limitations and Further Studies

There is a lake of sufficient published and surveyed materials in M-commerce development in developing countries. The results of this empirical study are valid only for Mongolia, which is a developing nation in terms of IT development.

As such, more global studies based on M – commerce are needed, in particular, further investigation in developing of mobile application services, and in the area of technological development, and the transition processes leading to the adoption of the 3G network, are all of vital importance.

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