Issues in Mobile e-commerce: A survey

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Abstract— **Mobile e-commerce or M-commerce describes online sales transaction that uses wireless or mobile electronic devices. These wireless devices interact with computer networks that have the ability to conduct online merchandise purchases. The rapid growth of mobile commerce is being driven by number of factors – increasing mobile user base, rapid adoption of online commerce and technological advances. These systems provide the potential for organizations and users to perform various commerce-related tasks without regard to time and location. Owing to wireless nature of these devices, there are many issues that affect the functioning of m-commerce. This paper identifies and discusses these issues which include technological issues and application issues pertaining to M-commerce.**

Keywords— **mobile, e-commerce, M-commerce**

I. INTRODUCTION

In its present state, M-commerce can be viewed as the extension of conventional, Internet based e-commerce which adds a different mode of network and accommodates different end users. The phrase mobile commerce or M-commerce means "The delivery of electronic commerce capabilities directly into the consumer's had, anywhere, via wireless technology". In another sense, M-commerce is simply defines as a way of exchanging products, ideas and services between mobile users and the service providers. M-commerce involves applications, wireless devices and middleware and wireless networks. Many of the existing applications of e-commerce could be modified to run in wireless environment, m-commerce involves many more new applications that become possible only due to wireless infrastructure. M-commerce is creating many new service opportunities such as payments, banking transactions, online gaming and paid mobile applications. M-commerce Mobile technologies have gained much attention with consumer oriented products and applications. It is being used as a tool for augmenting business strategies to support organizational processes with the integration of Internet based technologies.

Roots of M-commerce could be traced to e-commerce. Electronic commerce is the electronic exchange (delivery or transaction) of information, goods, services, and payments over telecommunications networks. E-commerce activities include establishing and maintaining online relationships between an organization and its suppliers, dealers, customers, strategic partners, regulators, and other agents related to traditional delivery channels.
Some of the other activities include:
- Product searches and comparisons by consumers;

- Product information presentation and promotion by the supplier;
- Post-purchase customer support;
- Communication between seller and shippers or banks; and secured payment by consumer.

The above mentioned discussion implies that M-commerce can be interpreted as a subset of e-commerce by referring to those e-commerce activities which involves wireless technologies i.e. mobile devices.

Mobile Devices are those devices that are used to connect the mobile services. Current wireless devices include:
- Wireless phones,
- Wireless-enabled handheld computers,
- Laptop computers,
- Vehicle-mounted technologies, and
- Personal message pager devices.

Mobile e-commerce can also be conducted using portable non-wireless mobile devices, such as
- Personal digital assistants (PDAs) and
- Laptop computers.

The rest of the paper is organised as follows: In Section II we discuss the taxonomy related to M-commerce. In Section III, we discuss the main issues pertaining to M-commerce. In Section IV, we discuss the conclusion for the paper and point some possible work in the future.

II. MOBILE E- COMMERCE TAXONOMY

Mobile devices are widely accepted due to the convenience and it will evolve into "personal trusted devices" which bundles user identity, purchasing power and benefiting various aspect of our daily lives. Mobile e-commerce results from convergence of two technologies, the internet and the wireless technology. And, while e-commerce in itself signifies much but mobile e-commerce have an edge since; any user could connect to internet wherever and whenever they want. Mobile m-commerce gives user unparalleled opportunities to leverage the benefits of mobility. It allows customers and businesses to build connectivity by transcending time and place, increasing accessibility, and expanding their social and business networks. M-commerce taxonomy is done on the basic of the services it provides:

A. Mobile financial services

One of the most promising services which is still in its infancy is, mobile financial services. Owing to wide penetration and personal nature mobile phones, the overall stability of mobile communication technologies and overall experience of m-commerce, mobile financial applications

are applicable for variety of mobile financial services. The following are some of the financial services which are offered by M-commerce [1]:

1. Mobile payments

M-commerce involves m-payment, which is defines as the process of two parties exchanging financial value using a mobile device in return for goods and services. A mobile payments system uses a secure electronic payment gateway.

2. Mobile banking

Mobile banking services enable user to receive information of their account balance via SMS or e-mail. Furthermore banking transactions could also be initiated by user, providing user place and time independence, and overall hassle-free work. Some of the various banking services provided by M-commerce are fund transfer between accounts, stock trading and conformation of direct transfer via SMS (Short Message Service).

B. Mobile advertisement

Mobile advertisement is a very important class of M-commerce. By keeping track of user's purchasing habits and current location, a target advertising campaign can be initiated. Advertising on mobile devices has tremendous potential due to the very personal nature of mobile devices and high targeting possibilities.

C. Mobile entertainment

Mobile entertainment or m-entertainment is concerned with providing users with services pertaining to enjoyable services via wireless devices. Mobile entertainment is B2C or business-to-consumer service. This includes video-on-demand audio-on-demand and interactive gaming services. Mobile entertainment has distinctive features like accessibility, personalization, localization, reachability which makes m-entertainment qualitatively different from online entertainment [1].

D. Mobile shopping

Mobile extends users ability to make transactions across time and create new transaction opportunities in fields of retail, booking tickets, reservations etc.

1. Mobile retailing

Mobile retailing is an M-commerce application to use a smartphone to order various services ranging from ordering a pizza to ordering a cab or buying some high end electronic gadget. M-commerce combined with location identification creates new avenue since in case of renting a cab the vendor can automatically know where the service has to be delivered.

2. Mobile ticketing

Mobile electronic purchase or reservations of tickets has traditionally been one of the first uses of M-commerce. Since, it is clearly more convenient to book a ticket via electronic media rather than being manually present.

III. MOBILE E-COMMERCE TECHNOLOGY ISSUES

Mobile devices have their own set of obstacles to tackle with.

When focusing more on the mobile shopping experience, many of these barriers for M-commerce can be overcome. The main three issues that concerned Mobile or wireless device users and prevented them from using their devices to engage in M-commerce revolve around[3]:

- Safety and security,
- Connectivity or communication infrastructure,
- Other issues related to wireless devices

A. Safety and Security

The most important element when we are dealing with M-commerce is security issues and how we can make it safe for customers to feel comfortable when using mobile phones, so in order to attract as many customers we need to insure the quality of the security level provided.

M-commerce is not possible without a secure environment, especially for those transactions involving monetary value. Therefore, there are three main areas related to security:

1. Security issues related to network technologies

GSM provides a relatively secure connection thorough the PIN (Personal Identification Number) when turning on the handset. An authentication protocol between handset and the network thorough SSL encryption of voice and data is also there in GSM. But it is not enough to convince people. In order to get the confidence of critical mass of consumers, more is expected in the field of security [4].

M-commerce applications, especially those involving payment need to be secured to assure customers. For example, in a payment scenario both sides will want to authenticate each other before committing to a payment. Also, the customer will want assurance about the delivery of goods or services. In addition to the authenticity, confidentiality and integrity of sent payment information, non-repudiation is important [2].

2. Security issues related to radio interface

Access to a telecommunication network requires the protection of transmitted data in terms of confidentiality, integrity, and authenticity. In particular, the user's data should be protected from eavesdropping. Different security mechanisms for different mobile network technologies like 2G, 3G.

B. Connectivity or communication infrastructure

Every mobile user in concerned with the quality of communication infrastructure in place since, it is one thing which decides the robustness of the network provided by the operator. Connectivity is also a major area of concern since many a time user couldn't access the network or the mobile phone is out of coverage. Due to mobile nature of the wireless devices this problem is more acute especially when a user is in middle of a transaction.

C. Other issues related to wireless devices

Mobile devices inherently suffer from many shortcomings. Some of them are listed below [2]:

1. User interface

M-commerce applications depend a lot on the user interface. Since a user interface is the first thing a user experience while dealing with M-commerce. User interface should be dynamic and adaptable.

2. Information disclosure

A key issue for consumers engaging in mobile commerce transactions is information disclosure. The technological constraints of mobile devices, including small screen sizes and limited memory or storage capacity, can limit the amount of information that consumers have access to during a transaction; a small screen for example, limits the amount of text that can be displayed to a consumer. Although newer smartphones are relatively bigger in size but a major chunk of mobile users are still using traditional small screen devices.

3. Speed concern

M-commerce applications are also limited by the slow or unstable connections, fearing they would be cut off in the middle on a monetary transaction; many users limit their use of M-commerce.

4. Pricing of M-commerce services,

Wireless carries also face challenges involving how to price mobile commerce services, and because several carriers are likely to be involves in completing a mobile commerce, another issue is how to divide revenues among multiple carriers.

5. Privacy and Advertisement

M-commerce transactions involve the collection of personal information about consumers, including their financial details. Given this, m-commerce transactions raise privacy issues for consumers.

IV. CONCLUSION

In conclusion, the article has looked at some of the most sensitive issues of the mobile commerce. Also, the article discussed what exactly mobile commerce constitutes of and different kind of services provided by mobile commerce.

REFERENCES

[1]   Md. Shahidul Abdul Seikh, *"Mobile commerce : The use of M-commerce by customers today"*
[2]   Sameer Yadav, *"M-commerce and its security issues"*
[3]   Rashad Yazdanifard, Mohamed Sayed Abdelgadir Elkhabir *"Mobile Commerce and Related Mobile Security Issues",* 2011 International Conference on Software and Computer Applications
[4]   Ravi Tandon, Swarup Mandal, Debashis Saha, *"M-commerce issues and challenges"*
[5]   Muhib Ullah, Siffat Ullah Khan, *"Challenges and Success Factors in Mobile Commerce Customer Relationships Management: A Systematic Literature Review Protocol"* IOSR Journal of Computer Engineering (IOSRJCE), ISSN: 2278-0661 Volume 2, Issue 3 (July-Aug. 2012), PP 25-34
[6]   Consumer Trends update, *"Mobile commerce :New experiences, new consumer issues"*