

# A Study on Mobile-Commerce

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**Abstract**—Mobile Commerce is the process of purchasing or selling items using mobile devices. Wireless internet promotes the financial activities and gives rise to another revolution in the business world. This revolution is focused on conducting business on the move of mobile commerce (m-Commerce). M-commerce is the subset of e-commerce. E-commerce helps in exchange of items between two parties using some electronic medium i.e. internet. The exchange of items is as transactions between companies and consumers, where consumers purchase products and services by credit card payment from a secured website. It helps to gain the consumer interest by accessing business services or by communicating with other consumers anytime and anywhere. This paper throws light on the significance and potential role of m-commerce in the development of business environment. It also undertakes the assessment of the conceptual background and existing regulatory framework of m-Commerce. This framework includes the four levels i.e. M-Commerce applications, user infrastructure, middleware, and network infrastructure. It offers a systematic and comprehensive understanding of M-Commerce and its utilities to both consumers and service-providers, and makes them aware of the new business opportunities. A consumer-centric m-Commerce model helps in analyzing the interaction types that a typical consumer might be engaged in within a wireless environment. It is followed by an analysis of the various consumer needs and concerns for m-Commerce services/products. Finally, the necessary business and technological requirements for the ultimate success of the m-Commerce applications are discussed along with some decision-making implications.

**Keywords:** m-commerce, e-commerce, wireless networks, wireless devices, middleware.

## 1. INTRODUCTION

Less than a decade after the e-Commerce revolution and its associated global impact on the business environment, it appears that another step has been taken in the evolution of networked computing. Transitioning from wired to wireless networks, the latest buzz in the industry is mobile commerce or m-Commerce [1]. As m-Commerce is a subset of e-Commerce. As we can say that the name “m-Commerce” arises from the mobile nature of the wireless environment that supports various mobile electronic business transactions. Devices, including digital cellular phones, Personal Digital Assistants (PDAs), pagers, notebooks, etc., can already access the Internet wirelessly and utilize its various capabilities, such

as e-mail and Web browsing. By using m-commerce we can access latest mobile applications and we can use these devices remotely, anywhere, at any time. We can use the same hand held device for both telecommunications and for bill payment and account evaluation. M-Commerce is a natural extension of e-Commerce as they share fundamental business principles, but m-Commerce acts as another channel through which value can be added to e-business processes. It also provides for new ways through which evolving customer needs could potentially be met [2]. According to European Information Technology Observatory (EITO) the total amount of revenues generated by Mobile Internet and Mobile Content services, combined together, were reported to be less than €19 million in the whole of Western Europe in 2001 [3].

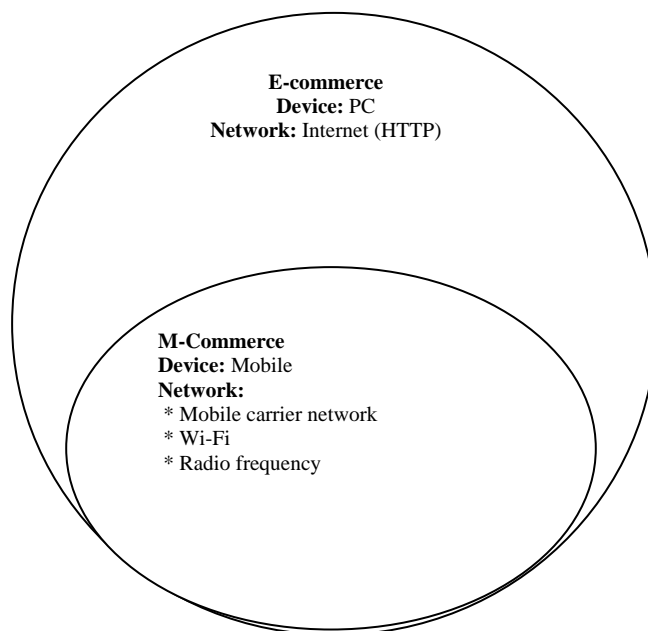


Fig. 1: M-Commerce-subset of E-Commerce

The revenues were generated primarily by paid-for services sold to subscribers of mobile phones. Demand for certain mobile financial services in Germany jumped up to 92% of bank customers with some 75% of them willing to pay for them. The reasons for these developments can be traced back

mainly to technology innovations, e.g. faster data transmission technologies and better mobile devices that are equipped with improved computing capacity, enhanced data storage and better user-interface. Some other factors, e.g. the increasing penetration of the society by mobile phones and the integration of world economies have also increased the need for mobility [4]. We can also say that Mobile commerce is defined as the buying and selling of products and services through the use of wireless mobile devices. M-commerce is considered the next generation of e-commerce and this particular technology will allow users to shop through Internet without a plug-in terminal. Fig. 1 represents that M-Commerce related to E-Commerce.

## DEFINING E-COMMERCE

A simple definition of E-Commerce describes it as: “the buying and selling of products and services over the Web” [5]. A type of business model, or segment of a larger business model, that enables a firm or individual to conduct business over an electronic network, typically the internet. Electronic commerce operates in all four of the major market segments: business to business, business to consumer, consumer to consumer and consumer to business. It can be thought of as a more advanced form of mail-order purchasing through a catalog. Almost any product or service can be offered via e-commerce, from books and music to financial services and plane tickets.

In e-commerce, exchanges occur between two parties over some electronic medium, typically the Internet. These exchanges are most commonly transactions between companies and consumers, wherein consumers purchase products and services by credit card payment over a secured website. These exchanges, however, can also include transactions between companies as well as between individuals. An example of business-to-consumer e-commerce would be an online store such as Jabong.com. Anyone with Internet access can access the website, browse products and services, make a selection, and purchase a product by credit card payment with the assurance of delivery in the mail.

## DEFINING M-COMMERCE

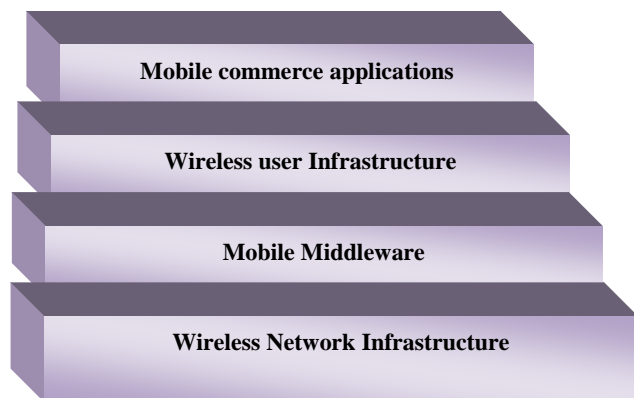
M-commerce (mobile commerce) is the buying and selling of goods and services through wireless handheld devices such as cellular telephone and personal digital assistants (PDAs). One of the definition of M-Commerce describes it as “any transaction with a monetary value that is conducted via a mobile telecommunications network” [6]. Some other definitions tend to ignore Telemetric, an important feature of M-Commerce. These definitions concentrate on the appliance of mobile hand-held devices. For instance: “M-Commerce is the buying and selling of goods and services, using wireless hand-held devices such as mobile telephones or personal data assistants (PDAs)” [7]. The buyer can use a variety of

electronic devices, such as cell phones, smart phones or portable Net books to browse and process orders. It also comprises of some characteristics which make it more reliable and these are:

- **Fast Processing:** One important characteristic of mobile commerce is that it allows the user to process a transaction fast. Not only does the customer receive his item almost instantly via download, e-mail or another form of electronic delivery, the business owner receives payment for his product or service more quickly compared to traditional methods. The customer must set up a payment option, such as a credit card or an agreement to pay using a specified account, to process the payment immediately before downloading the item. Of course, the speed of delivery is dependent on the reliability of the Internet and network services.
- **Reduced Business Costs:** Mobile commerce also helps reduce costs for the seller. They rarely need to pay for a separate office space, overhead costs or employees. In some cases a small business owner who sets up a mobile commerce operation doesn't need an office at all. The seller can monitor sales online or by receiving statements from a processing service. The main expense for this type of business owner is advertising to disseminate information on how users can access the product or service. The lowered cost allows the business owner to take advantage of a higher per-sale profit.
- **Little Need for Maintenance:** Another characteristic of mobile commerce is that it requires very little maintenance from the seller. The owner sets the product up for mobile delivery one time and then receives payment for sales automatically. From time to time, he may need to perform a few maintenance duties, such as correcting a technology error or updating the product, but overall it is a selling format that requires very little management compared with other selling strategies.

## 2. FRAMEWORK OF M-COMMERCE

The use of mobile and computers is growing rapidly and via internet services on the personal computers financial operations can easily be performed like paying bills and buying products etc. To perform the same application on the mobile, a different approach is followed i.e. m-commerce. The framework of m-commerce includes the four levels i.e. M-Commerce applications, user infrastructure, middleware, and network infrastructure. To build m-commerce systems, a single entity is not forced to do everything; it can be built on the functionalities provided by others [12].



**Fig. 2: Architecture of M-Commerce**

The above mentioned framework depicts the design of mobile commerce application.

It takes into consideration the vernal capabilities of user infrastructure (mobile devices). It hides the underlying details of wireless and mobile network from applications and provides an inform interface for use.

- **Mobile commerce applications** are categorized as transaction management, digital content delivery and telemetry services. The applications can be further subdivided into passive and active m-commerce applications. Active application relates with the applications in which the user has to take the initiative on his wireless device. In contrast, the passive applications themselves get activated towards accomplishing the assigned jobs or facilitate the users to carry forward.
- To support applications that have been described in the previous layer we need mobile devices that provide sufficient memory, display and communication facilities .The limitations of these user devices may influence the type of applications that may be run on them.
- **Mobile middleware** is an important part of Mobile commerce interaction. It can be defined as an enabling layer of software that is used by the applications development to connect the m-commerce applications with different networks and operating systems without introducing mobility awareness in the applications. It is responsible for uniting different applications, network technologies and tools which allows the user to interface through a common interface. The integration of middleware services and standards promotes formats such as WAP, XML/XHTML and i-Mode.
- **Wireless networking** is responsible for providing multicast support and user access to multiple networks. It also tracks the users at various locations and maintains the quality of service by regulating bandwidths and detecting the faults occurring.

### 3. SERVICES OF M-COMMERCE/LIMITATIONS

M-Commerce is an emerging discipline which includes mobile applications, mobile devices, middleware and wireless networks. As M-Commerce provides many services which make transactions easy, and transfer documents from anywhere through mobile device.

- **Mobile Money Transfer:** Money transfer is mainly done through the use of mobile phones. This was an initiative of a multimillion shillings company in Kenya. Mobile money transfer services in Kenya are now provided (M-PESA and ZAP).
- **Mobile ATM:** With the introduction of mobile money services for the unbanked, operators are now looking for efficient ways to roll out and manage distribution networks that can support cash-in and cash-out. In Hungary, Vodafone allows cash or bank card payments of monthly phone bills [11]. The Hungarian market is one where direct debits are not standard practice, so the facility eases the burden of queuing for the postpaid half of Vodafone's subscriber base in Hungary.
- **Mobile ticketing:** Tickets can be sent to mobile phones using a variety of technologies. Users are then able to use their tickets immediately, by presenting their mobile phone at the ticket check. Most of users are now moving towards this technology. Best example would be IRCTC where ticket comes as SMS to users.
- **Mobile vouchers, coupons and loyalty cards:** Mobile ticketing technology can also be used for the distribution of vouchers, coupons, and loyalty cards. These items are represented by a virtual token that is sent to the mobile phone. A customer presenting a mobile phone with one of these tokens at the point of sale receives the same benefits as if they had the traditional token. Stores may send coupons to customers using location-based services to determine when the customer is nearby.
- **Content purchase and delivery:** Currently, mobile content purchase and delivery mainly consists of the sale of ring-tones, wallpapers, and games for mobile phones. The convergence of mobile phones, portable audio players, and video players into a single device is increasing the purchase and delivery of full-length music tracks and video. The download speeds available with 4G networks make it possible to buy a movie on a mobile device in a couple of seconds [14].
- **Location-based services:** The location of the mobile phone user is an important piece of information used during mobile commerce transactions. Knowing the location of the user allows for location-based services such as Local discount offers, Local weather and Tracking and monitoring of people.

- **Information services:** A wide variety of information services can be delivered to mobile phone users in much the same way as it is delivered to PCs. These services include News, Stock quotes, Sports scores and financial records.
- **Mobile Banking:** Banks and other financial institutions use mobile commerce to allow their customers to access account information and make transactions. This service is often referred to as Mobile Banking, or M-Banking [13].

**3.2. Limitations of Mobile Commerce:** Every invention has its own benefits and limitation. It is applicable in this m-Commerce business also.

- **Smart phone limitation:** Thousands of types of smart phones are available in the market. Some phones have slow processors and limited memory which may or may not be suited for a particular application. Mobile has no big screen like desktop or laptops, so sometimes users tried to navigate more and more to choose just one item from thousands. It affects shopping rates.
- **Habituate:** Every new technology has some problem at the starting phase. Here m-Commerce is new application, so sometimes people avoid changing which are rapidly changed. As they are habituate to buy products from e-Commerce.
- **Risk factor:** Each business has its own risk. Same Mobile commerce is the growing field and a lot of investment in this field is become risky. Because technology change day by day. Moreover, there less security in wireless network, so in data transfer hacking chances are more.
- **Connectivity:** Mobile commerce needs high speed connectivity of 3G. Otherwise it is become hectic for user to go through entire product purchase process.

#### 4. CONCLUSION AND FUTURE SCOPE

The m-Commerce industry is fast growing with estimates of reaching a user base of 1.3 billion people around the world. Industry players, ranging from network carriers to content provider hope to capture part of this revenue. However, early results were not up to the hyped expectations, due to a combination of reasons covered in this paper as technology limitations or consumer concerns to the various business applications concerns center on the issues of cost, speed, usability, security, and privacy. No doubt mobile commerce needs some development in specific area like secure transaction, better shopping experience and enhanced graphics. Other than this mobile commerce opens new era of shopping. Thus, the future of m-Commerce seems extremely bright because several experiments are going on to introduce the upgraded version of mobile likely to emerged with the evolution of 4G mobile technology.

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