



# M-Commerce: Analysis of Impact on Marketing Orientation

Nenad Jukic and Abhishek Sharma

Department of Information Systems and Operations Management, Loyola University, Chicago, Illinois  
Tel: (312) 915-6662, Fax: (312) 915-6432, {njukic, asharm3}@luc.edu

Boris Jukic

School of Management, George Mason University, Fairfax, Virginia, Tel: (703) 993-1784, Fax: (703) 993-1809, bjukic@som.gmu.edu

Manoj Parameswaran

Department of Decision and Information Technologies, Robert H. Smith School of Business, University of Maryland  
Tel: (301) 405-3428, Fax: (301) 405-8655, pcm@rhsmith.umd.edu

## ABSTRACT

*This paper analyzes the potential ramifications to the field of marketing and changes in the market due to the advent of Mobile Commerce (M-Commerce). M-Commerce has been defined as a process of conducting commercial transactions via a "mobile" telecommunications networks using a communication, information, and payment devices such as a mobile phone or a palmtop unit. This paper analyzes the opportunities that various characteristics of the M-Commerce model bring to the field of marketing. In particular, the paper investigates the likelihood of emergence of mall-like zones that are based both on the geographical proximity of services and goods providers and the use of mobile communication devices. Such zones have a potential of becoming the basic units for any marketing analysis of M-Commerce scenarios. As M-Commerce attains maturity, the zones could become the fundamental parameter in marketing evaluation.*

## INTRODUCTION

The advent of wireless and mobile technology has created both new opportunities and new challenges for the business community. In this paper we examine the potential impact of mobile commerce (M-Commerce) on the relationship between customers and the providers of goods and services.

In its present state, M-Commerce can be viewed as an extension of conventional, Internet-based E-Commerce, which adds a different mode of network and accommodates different end users' characteristics. However, if the predictions stating that mobile and wireless computing will dominate the Internet industry in the future [Vetter 2001] materialize, the E-Commerce and M-Commerce could become a singular blended entity. M-Commerce, as defined by Muller and Veerse, stands for conducting commercial transactions via a "mobile" telecommunications network using a communication, information, and payment (CIP) device such as a mobile phone or a palmtop unit [Muller-Veerse 1999]. In a broader sense, M-Commerce can simply be defined as exchanging products, ideas and services between mobile users and providers.

In Section 2 of this paper we will give an overview of the characteristics of M-Commerce. We discuss the basic characteristics of M-Commerce that have the potential to influence the basic marketing orientation of both sellers and buyers, and, above all, alter the general dynamics of the market. In Sections 3-8 we discuss various ways in which the emergence of M-Commerce could impact basic marketing orientation/factors and overall marketing dynamics. Finally, in Section 8 we offer a conclusion and describe our future work.

## CHARACTERISTICS OF MOBILE COMMERCE

The terms mobile and wireless are often thought of as synonyms, but this is not always entirely accurate. The mobile user does not necessarily need to use wireless interfaces and wireless interfaces do not necessarily support mobility [Varshney and Vetter, 2000]. For example, a user can browse through a store with a hand-held device scanning items for inclusion into a wedding-registry database. The information will be transferred into the database once the user has finished browsing through the store and handed over the hand-held device to the store clerk. The user was mobile, even though no wire-

less communication technology was used. On the other hand, a user sitting in his home could be using a wireless network as a part of his Internet connection, and that still would not make him a mobile user.

A mobile network is characterized by two main capabilities. The first is the ability to maintain communication between non-static locations. The second critical feature is the capability to keep track of the location. The technologies that satisfy these criteria are progressing at an amazing pace in the form of wireless local area networks (WLANs), satellite based networks, wireless local loops (WLL), mobile Internet protocol (IP), and wireless asynchronous transfer mode (ATM) networks [Varshney and Vetter 2000]. However, just the extent of basic cellular phone usage is a good enough indicator of the magnitude of wireless potential. Already, the cellular subscribers in Europe, the U.S. and Asia are far greater than the users of the Internet<sup>1</sup>.

In addition to providing users with mobility and the ability to be tracked, M-Commerce applications have the ability to achieve a high (detailed and accurate) level of personalization of the interaction with the customer. For example, as an addition to a web database, an M-Commerce engine can contain a real time personalization engine that will contain the personal profile of the individual, the preferences, location marks for home or office and secure online payment details [Waddington, 2001]. Since M-Commerce provides a highly interactive environment, personalization through techniques like collaborative filtering can be highly accurate. One of the more disruptive aspects of E-Commerce has been the inability to verify the accuracy of much of the data passed into the system. In other words, the data gathered via interactive web sites is as accurate as the input skills (or intentions) of the user who entered them. On the other hand, due to the simultaneous automatic interaction between the consumer and the service provider in the M-Commerce setting, accurate individual data can be collected in an easy manner.

In addition to the obvious ability to influence the consumer behavior, M-Commerce has the opportunity to create utilities of various types. The following sections discuss such opportunities.

## THE IMPACT OF MOBILE COMMERCE-CREATION OF ZONES

The foremost perceptible influence of M-Commerce, as it assumes significant dimension, could be the systematic but rapid genera-

tion of wireless shopping areas or zones, similar to real or virtual malls. These emerging market entities could be more effectively targeted than their predecessors. A zone would be characterized by a renewed focus of the sellers/suppliers on the prospective clients in the zone and by a highly specific conversation between sellers and the zone-specific customers. The arrival of M-Commerce devices that dynamically keep track of the best deals on commodities and their respective locations, could further facilitate the formation and subsequent distinction of zones based on the extent of the mobility of their customers and the degree of communication with the seller. In addition, within a zone, customers' movement will not create or deplete the place utility of a product, but a seller who is aware of the fact that the customer is equipped with the information on the best options for purchase, might be forced to come up with the best price to attract the customers for its general commodities. In other words, removing the uncertainty regarding prices of comparable goods available in two (or more) stores within one zone adds incentive to consumers to purchase a portfolio of lowest priced goods from multiple stores (assuming, as stated above that place utility within the zone has marginal value of zero). This realization could lead to a rapid reduction in prices within limited zones that eventually culminates as a terminal value of prices for every commodity in a particular zone. These effects can be summarized as the development of zones into wide and diversified (but integrated) supermarkets that are easily accessible to an associated population of customers and operate upon a strong, constant, two-way conversation between the seller and the buyer. Another ramification could be price differences (premium/discounts) between zones based upon the place utility of the respective zones. However, as stated earlier, prices for comparable goods and services within zones would be under strong pressure to remain uniform. Furthermore, there is a possibility of price wars between zones and/or existing supermarkets. Under these conditions, the suburban supermarkets could be forced to maintain lower prices to compensate for the lack of place utility for their services.

As a synonym of accentuated and prompt interaction between the seller and the buyer, a zone may adversely affect the effectiveness of discount as a marketing tool. The most common inspiration behind offering a discount is the tendency of the buyer to buy more than what s/he needs or to buy a product that does not match exactly his/her needs. Under the new circumstances, a discount would quickly propagate throughout the zone and this new price will leave no incentive for the buyer to stock for the future or needlessly deviate from his/her usual course of purchase.

Finally, let us emphasize that the concept of the M-commerce enabled zone does not necessarily spell doom for highly specialized and customer service oriented smaller stores. However it does create additional pressure for such outlets to further redefine the additional utility they deliver to their customers in terms of their commitment to the level of individual customer services larger stores can simply not provide.

## **THE IMPACT OF MOBILE COMMERCE - PLACE UTILITY**

Due to the constant tracking of the goods an individual needs, and equally vigilant tracking of the customers, individual purchase opportunities can be optimized. This scenario can be compared with one where a good is always available to the customer at a fixed/convenient distance (the extent of a zone). For example, a person who can issue and transmit a query in the middle of a zone, seeking a closest Pizza-Hut restaurant, can be considered as an individual who carries proximity to the store along with him. This association of quick and ubiquitous availability of desired goods in a zone can lead to other subtle but important impacts on the marketing strategy, pricing decisions and consumers' orientation.

As a reverse trend in a consumer and seller relationship, the stores could come closer to the customers or to the places where their chances of intersecting the customers are greater. This further implies

that the suppliers could be forced to spread their operations across wider regions to increase interaction with customers. This expansion should be directed towards having presence in more than one zone rather than a heavy concentration towards one particular zone. Direct implication of this reshuffle could be specifically borne by the bulky retail entities like supermarkets that are characterized by suburban location, huge inventory stock and attractive one-stop-shopping-appeal. With the advent of the facility that could provide dynamic information regarding the best bargain nearest to the customer, this appeal of one stop shopping could face a serious challenge as the motive behind the journey to a suburban superstore or mart fades and could be replaced by a short sprint to the nearest zone, as long as the combined price of the bargains found in customer's zone exceeds the lower prices and higher place disutility of the same basket of goods found in a more remote location.

## **THE IMPACT OF MOBILE COMMERCE - PERSONALIZATION**

Personalization has been one of the foremost aims of any marketing tool ranging from the traditional advertisement to modern E-Commerce technologies. M-Commerce can be used as a tool to realize this basic goal with relative ease. For example, a retail chain can target all females aging 14 to 21 who are within 400 meters of its stores anywhere in the country with its latest bargain. In this context, two relevant features of the M-Commerce architecture are the ability of the system/engine to track the individual and the quality/strategy of personalization engines.

The ability of the system to track implies essentially a robust platform that allows triangulation between different network base stations, which in turn allows the network and mobile devices users to track the location of other users within the range of the zone<sup>2</sup>. The 'tracking ability' of M-Commerce can provide the exact co-ordinates of the individual and henceforth suggest the nearest commodities that suit his/her profile, providing those coordinates as well. With technology like Bluetooth (or product "BlueCore"), a store/group of stores of any size will mimic as a carefully arranged grocery store that considers the buying pattern of the individual. This extreme level of target marketing is difficult to achieve by traditional methods.

At the same time, new personalization engines/techniques (especially implicit techniques like "collaborative filtering") could raise the personalization to a level that is far greater than a simple sum of a few patterns computed by traditional rule based or segmentation-based software. Instead of just figuring out what product a customer will be interested in, these personalization techniques operating in the M-Commerce scenario could even arrive at conclusions about the psychology of the individual. The massive strength of the personalization techniques in M-Commerce emanates from the ability of the system to keep a close watch on all the activities/behavior of the individual and henceforth provide a rich implicit input at "collaborative part" of the personalization engine, which makes the filtering and extrapolation part of the process more accurate.<sup>3</sup>

## **THE IMPACT OF MOBILE COMMERCE - PROMOTIONAL UTILITY**

As an aftermath effect, the formation of zones and high level of personalization could make M-Commerce an ideal tool of promotional utility. As mentioned earlier, M-Commerce as a gateway to immense personalization could translate well into the promotion of a good or service. It is highly probable that personalized promotion efforts could materialize into more successful market conversations. In a hypothetical situation, where a restaurant sends its menu for the day to all the prospective customers in a 200-meter radius, due to personalization techniques, every individual will receive his/her favorite dish in highlighted or different format. Since promotional messages to customers will be based on their respective co-ordinates, these wireless advertisements could be considered as billboards on the top of

the stores, which are visible only when you step into that particular zone. With the combination of tracking ability and high level of personalization, M-Commerce promotions can guide the target customer to the doorstep of the store, an attribute absent in traditional promotional efforts.

Despite this reshuffle and the creation of new stores in the market, some of the restrictions could still hold fast. There could be little "zone effect" on the goods like cars, expensive electronics and jewelry, where place utility does not match price utility. Added to it, even easy access to goods might not dissolve brand equity.

## THE IMPACT OF MOBILE COMMERCE - INTERACTION

Another major influence of M-Commerce on market dynamics could be related to the level of interaction between the seller and the buyer. M-Commerce can expedite the interaction between the store and the consumer and bridge the associated gaps of E-Commerce. In M-Commerce, the target customer is highly mobile and moves in close surroundings to the seller. Under this scenario, there could be a perceptible reduction in the time between advertisement and the actual transaction. This can be compared to the market of yesteryears where a seller shouted his offer to the customer and the customer gave an immediate reply. M-Commerce has facilitated a geographical proximity between the seller and the customer, a characteristic absent in E-Commerce. E-Commerce has faced challenges in the individual-specific goods like clothes/garments and fragrances, which can never be bought without personal involvement. In many cases, personal goods simply require physical presence of the end user.

As discussed earlier, the entry of M-Commerce can affect the general characteristics of marketing. These effects can be different for different market segments and they can vary in intensity. A regular E-Commerce customer, who is mainly concerned with the cost part of the transaction, may not be highly influenced by M-Commerce in the initial days, but as zones start forming, M-Commerce can be a competitive and cheap alternative to E-Commerce. During the infancy of M-Commerce (pre zone time), the target market for M-Commerce will be those individuals who care more for the time utility created by the service rather than the price utility. At this time, a typical M-Commerce customer will be a highly mobile individual who is explicitly willing to pay for the place utility generated. However, the repercussions of M-Commerce can raise significant challenges for the marketing appeal of an E-Commerce model based on cost reductions, just-in-time and easy access to major alternatives for a transaction, since the M-Commerce will undoubtedly with time achieve those same functionalities and surpass them as it fully utilizes the mobility aspect.

## CONCLUSION

This paper analyzed and described a conceptual framework for the progression of the initial stages of M-Commerce, with special emphasis on how the target market may change as the technology attains maturity. Recent trends illustrate a rapidly changing environment, where about 300 million subscribers have moved to different forms of wireless technology to acquire mobility and to achieve quick communication network [Telecommunication Industry Survey]. At the same time liquid crystal display technologies, and electric and digital papers are indicating the arrival of wireless communication as a way of life [Vetter, 2001]. Under these circumstances, the discussed aspects of M-Commerce assume unprecedented importance.

In future, we will expand this conceptual framework into a more structured hierarchy of business models. This would be reinforced by continued monitoring of the evolving m-commerce marketplace. This will give us a basis to evaluate the predicted trends using empirical observations, and to validate the model. We also plan to further analyze and study the potential impact of the dynamics of the zones. In doing so, the focus will be on comparing and contrasting M-com-

merce zones with real or virtual malls that currently exist. Our goal is to develop guidelines that can be used in designing such zones and tailoring feasible marketing strategies for them, for different stages in the adoption of M-commerce. Finally, we are working on developing a prototype-system that implements a range of personalization strategies utilizing technologies such as mobile XML and application of mobile agents, which is to be used as a testbed for demonstrating and fine tuning customer profiling and target marketing techniques.

## ENDNOTES

1 In 1999, Europe, US and Asia, the cellular subscribers were 178,612400, 161373200, 134548400 as compared to Internet users 70255000, 13126000, 49,323500 respectively [ITU].

2 The British based firm 'CellPoint' is currently the only telecommunication company in the world that offers commercially proven digital cellular positioning systems. However, so far the technology has been primarily used as a means of recovering stolen cars in South Africa.

3 In a collaborative filtering process, the unknown user provides the answers to a small number of questions ("the collaborative part"), which the personalization tool compares with the known preferences of customers in its database (the "filtering" part). The tool then generates a temporary community of customers with these shared preferences. It can now extrapolate recommendations based on other preferences the community shares [John K. Waters, May 2000].

## REFERENCES

- Upkar Varshney and Ron Vetter: Emerging Mobile and Wireless networks, Communication of the ACM, June 2000, Vol. 43, number 6, page 73-81.
- Patricia Waddington: Wireless Odyssey, Oracle Magazine, Volume XV, number 1, January/February, 2001, page 81-108.
- John K. Waters: "Getting personal on the web", Application Development Trends, May 2000, page 25-32.
- Telecommunication Industry Survey, Standard and Poor's, June 22, 2000
- Ron Vetter: Wireless Web, Communication of the ACM, March 2001, Volume 44, Number 3, page 60-61.
- ITU (Internet host data: internet software consortium, RIPE)

0 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

[www.igi-global.com/proceeding-paper/commerce-analysis-impact-marketing-orientation/31778](http://www.igi-global.com/proceeding-paper/commerce-analysis-impact-marketing-orientation/31778)

## Related Content

---

### On-Line Credit and Debit Card Processing and Fraud Prevention for E-Business

James G. Williams (2018). *Encyclopedia of Information Science and Technology, Fourth Edition* (pp. 2707-2722).

[www.irma-international.org/chapter/on-line-credit-and-debit-card-processing-and-fraud-prevention-for-e-business/183982](http://www.irma-international.org/chapter/on-line-credit-and-debit-card-processing-and-fraud-prevention-for-e-business/183982)

### Software Development Process Standards for Very Small Companies

Rory V. O'Connor (2018). *Encyclopedia of Information Science and Technology, Fourth Edition* (pp. 6927-6938).

[www.irma-international.org/chapter/software-development-process-standards-for-very-small-companies/184389](http://www.irma-international.org/chapter/software-development-process-standards-for-very-small-companies/184389)

### Construction of Building an Energy Saving Optimization Model Based on Genetic Algorithm

Xin Xuand Xiaolong Li (2023). *International Journal of Information Technologies and Systems Approach* (pp. 1-15).

[www.irma-international.org/article/construction-of-building-an-energy-saving-optimization-model-based-on-genetic-algorithm/328758](http://www.irma-international.org/article/construction-of-building-an-energy-saving-optimization-model-based-on-genetic-algorithm/328758)

### An Efficient Server Minimization Algorithm for Internet Distributed Systems

Swati Mishraand Sanjaya Kumar Panda (2017). *International Journal of Rough Sets and Data Analysis* (pp. 17-30).

[www.irma-international.org/article/an-efficient-server-minimization-algorithm-for-internet-distributed-systems/186856](http://www.irma-international.org/article/an-efficient-server-minimization-algorithm-for-internet-distributed-systems/186856)

### Parental Mediation of Adolescent Technology Use

J. Mitchell Vaterlaus (2018). *Encyclopedia of Information Science and Technology, Fourth Edition* (pp. 7097-7105).

[www.irma-international.org/chapter/parental-mediation-of-adolescent-technology-use/184406](http://www.irma-international.org/chapter/parental-mediation-of-adolescent-technology-use/184406)