

Wireless Commerce: Marketing Issues and Possibilities

P. K. Kannan
 University of Maryland,
 College Park, MD 20742
pkannan@rhsmith.umd.edu

Ai-Mei Chang
 National Defense University
 Washington, DC 20319
chang@ndu.edu

Andrew B. Whinston
 University of Texas
 Austin, TX 78712
abw@uts.cc.utexas.edu

Abstract

Wireless commerce is viewed as the extension of the Internet-based e-commerce beyond the static terminal of the PC or the Web-TV to the flexible anytime, anywhere, anyplace context of the mobile environment. While many in the industry and popular press seem to equate the world of Internet e-commerce and wireless commerce as one and the same, there are unique characteristics of the wireless technology and its usage that renders it distinctly different from and complementary to Internet based e-commerce. This difference also has important implications for the marketing of good, services, and content and for conducting marketing research using wireless technology. In this paper, we first discuss the unique characteristics of wireless technology and its usage. On the basis of these characteristics, we identify and set out a series of propositions that relate to the issues of marketing and marketing research using wireless technology. In making our arguments, we view how wireless technology's contribution complement the capabilities brought about by Internet based e-commerce. Finally, we outline a marketing research agenda that will allow testing of some of the propositions put forth in the paper.

1. Introduction

Wireless commerce – the concept of enabling enterprise and commerce applications for customers, partners, and employees anytime, anywhere, anyplace – is now being viewed as the next big technology enabled breakthrough looming over the horizon. Many mobile devices such as laptop computers and personal digital assistants (PDAs) are already being used as extended enterprise tools. This mobile suite is now being supplemented by digital telephones with Internet and wireless data access capabilities. The extended enterprise applications are closely followed by wireless commerce applications directly to the customer and the consumer via these wireless devices. The market potential for wireless

commerce is quite significant. Market researchers predict that by the end of 2005, there will be almost 500 million users of wireless devices, generating more than \$200 billion in revenues [6].

The wireless economy can be represented as consisting of four layers (see Figure 1): the Wireless Infrastructure layer consisting of the infrastructure providers, the Applications layer consisting of organizations developing wireless applications, the Intermediaries layer, organizations adding value in the commercial processes, and the Online Transactions layer consisting of organizations involved in wireless commerce transactions. The four layers are interdependent and the players in each layer need to foster close partnerships with players in other layers to make the commerce applications work – no single layer has all the skills and the resources to deliver the end-to-end experience. Developing these partnerships and the associated business models in the key challenge of the wireless commerce market. In this paper, we focus on issues that are highly relevant in understanding how the marketplace can be shaped and what kinds of business

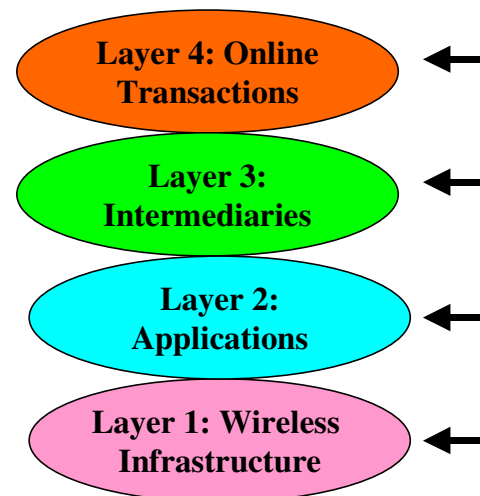


Figure 1: The Wireless Economy

models can be designed by examining issues of marketing and marketing research using wireless technology.

In the next section we will examine the characteristics of wireless technology, which have important implications for the types of commerce applications that it can support. We then develop taxonomy of wireless commerce applications that will allow us to examine the impact of the technology on marketing and marketing research using wireless devices. In section 3, we examine these issues in detail and develop propositions based on our arguments. We conclude in section 4 with an outline of the research agenda that will be necessary to test some of our propositions.

2. Characteristics of Wireless

The key characteristic of the wireless device can be summed up in two words “ubiquitous interactivity” (Figure 2). It is a *personal* device, which is always handy and available at all times on a person. In addition, the device carries its user identity. This is a significantly

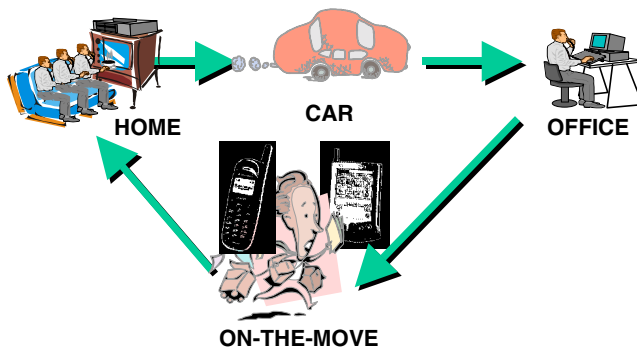


Figure 2: Ubiquitous Interactivity

distinctive characteristic as compared to a PC or a laptop, which are not generally handy or easy to use at a moment’s notice, although they may be available at all times. Second, a wireless device is distinctly personal and the usage can be tracked down to an individual rather than the household as in the case of a PC or other devices. Third, wireless technology is “location aware” – that is, it is easy to track down where the user physically is as long as the wireless device is on. These characteristics have important marketing implications, as we will later analyze.

The wireless technology also has some constraints that limit its usage in the near future. Given the constraints of its size for a handy usage, the user interface of a wireless device is quite limited and cannot display information-rich content in a useful way. This constraint also limits the client capabilities for processing and storing information and data. Most importantly, the bandwidth over the air for wireless transmission is also a constraint in the near future. These constraints limit the use of wireless

technology for predominantly text-based, less information-intensive exchanges and interactions. Thus, if wireless environment is viewed purely as an extension of the Internet environment, it is a downgraded Web access at best.

New possibilities for commerce using the wireless technology emerge when it is seen not just as a Web access. Since wireless is a personal device, it is easy to use for identification and authentication purposes both for restricted access and for payment purposes. This implies that it could be used as a substitute for credit cards. The fact that it is available at all times to interact with users suggests that it can be used to obtain instant feedback from customers at the usage context for market research purposes. The location awareness characteristic of wireless technology also suggests the possibility of providing consumers advertisements, information content (e.g., price alerts) at the point of need, be it in a car, or in a brick-and-mortar store, or any other place.

Many players in the wireless application arena are attracted to the enormous potential that wireless technology has in customer acquisition and retention. There are four factors that make wireless the ideal technology to implement the concept of customer relationship management (CRM): (1) the ability to provide truly personalized content and service by tracking personal identity; (2) the ability to track consumers across media and over time; (3) to provide content and service at the point of need, and finally, (4) the capability to provide content of highly engaging characteristic. Given this it is not surprising that business-to-consumer wireless applications dominate the list of commerce applications that are emerging in the market place (see Figure 3).

In the B2C domain, wireless can be effectively used to provide point-of-purchase support for the buying goods in a brick and mortar (B&M) environment. This could be retrieval of product information (price, quality ratings of alternatives from different competitors), usage of the product information, budget and payment information, etc. Another possibility is the use for auction purchases where the anywhere, anytime quality of wireless technology proves very useful. Similar uses could be visualized in the B2B arena but impact is a little less significant. The most significant possibilities lie in the marketing of services over wireless, ranging from interactive games, gambling, booking and ticketing for travel, hotels and events, banking and stock trading, and for e-promotion and marketing research purposes. Wireless also provides a very viable means of streaming customized content (cross-media content – music, text information at the point of need, advertisement) and for interaction with other users (e-mail, chat, discussion etc). It is to be noted that substitutes for wireless exist for most of the above applications and wireless will become the device of primary choice for these applications when all the virtues

B 2 C	Point-of-Purchase Support for B&M	Interactive Games Gambling	Cross-Media Content
	Auction Trading	Booking/Ticketing Services	Advertisement
	Vending	Banking/Trading	Needs based Content
B 2 B	Procurement JIT systems	E-Promotions/ Loyalty Schemes/ Market Research	Interactive Chat Discussion
	Auction/Exchange Trading	Customer Support	Ads/Need based Content

Figure 3: Wireless Commerce Applications

of wireless – convenience, cost and compulsion to use – are fully realized.

3. Marketing in a Wireless Environment

In order to understand how wireless technology impacts the marketing of goods, services, and content, it is necessary to understand how wireless technology affects some of the aspects of consumer behavior and the choice environment.

3.1. Search versus Convenience

In a time-starved environment that consumers operate in today's world, wireless can affect consumers' search behavior significantly. Given the high value of time, consumers may value the convenience wireless technology affords and thus may reduce their search time. This has implications for consumers' consideration sets – the players that have access to consumers through wireless technology may benefit as they may figure in consumers' consideration sets more often than the others. This is especially true for low involvement products – goods such as books, CDs, music and such. This implies that first movers with wireless technology can benefit at the expense of their competitors as a segment of consumers value the convenience aspect of the technology. For example, Amazon.com will be soon be providing capabilities to search for and order books using wireless, which is likely to attract consumers with high value for time. This is particularly advantageous to consumers as it affords them to parallel process different activities at the same time – for example, ordering books while watching children's soccer practice or waiting at the doctors office. Since consumers with time pressure often simplify their purchase decision processes, it can be conjectured that when consumers purchase goods using wireless technology their consideration set sizes are likely to much smaller than when similar purchases are made in other environments with similar availability in all environments.

Proposition 1: While using a wireless device to make purchases, consumers' consideration set sizes are likely to be much smaller than when making similar purchases in other environments. Consequently, an organization having a significant presence in consumers' consideration sets through providing good customer experience, service, and brand will gain a significant competitive advantage.

3.2. Information at the Point-of-Sales

One of the key advantages of wireless technology is the provision of product-related, pricing and other relevant information at the point-of-sales. Since the technology is "location aware" it is possible to provide such information at the point of need. This has significant marketing implications:

3.2.1. Impulse Purchase Behavior. Consumers typically exhibit impulse purchase behavior in product categories of low value and low involvement. Availability and accessibility play an important role in shaping consumers' impulse behavior. Thus, if a book could be ordered using wireless as a consumer is chatting with a friend about various authors, then to that extent purchase becomes immediate rather than delayed. Such accessibility to the market that wireless technology enables, could result in an increase in consumers' impulse purchase behavior for low value and low involvement products. Similarly, the fact that market data could be accessed immediately for product, price and quality comparison, could also mean that even for higher value products, consumers could act on their impulse immediately. Thus, one could argue that, since wireless enables instant gratification and immediate fulfillment of a need, it could have a positive impact on their impulse purchase behavior. While similar effects could be hypothesized with regard to Internet commerce, we should expect to find the magnitude of the effect to be much stronger in the wireless environment.

Proposition 2: Wireless environment is likely to significantly increase the frequency of impulse purchases especially in low value, low involvement product categories.

In conjunction with Proposition 1, the above proposition highlights the importance of being the first-mover in wireless space and establishing a strong presence in that environment, especially for low involvement product categories. It is not therefore surprising that organizations such as Amazon.com are already staking out their positions in the wireless marketplace.

3.2.2. Impact of Price Comparisons. One of the undeniable impacts of Internet commerce has been the widespread instances of price competition across several product and service categories. Since agent technology makes it easier to compare product, price, and quality details at the click of a mouse, businesses selling products and services on the Web have had to contend with the inevitable price competition. Thus, if the prices are not competitive, many Web retailers lose their customers at the click of a mouse. The brick and mortar retail stores, although affected to a great extent by the growing competition on the Web, at least have had the inherent lock-in of consumers who on entering the stores have expended some effort in getting to the stores. Once inside the B&M store, price comparisons cannot be made so easily and hence retailers could work on consumers to make the sale. However, with the availability of price information (in addition to other relevant information) over the wireless, consumers can access relevant data right at the point-of-sales as if they were on the Web. We argue that the net impact of such accessibility of information in a B&M environment will be increase to the power of the consumers to negotiate and obtain better prices in B&M retail stores. The distinction between an Internet retailer and a B&M retailer will soon disappear with regard to pricing. Just as Internet retailers change prices several times a day and price match with competition, B&M retailers will also change their prices and price match, and be increasingly willing to negotiate prices with consumers.

Proposition 3: With the increased use of wireless commerce, the brick-and-mortar retail environment will be increasingly characterized by dynamic pricing models.

3.3. Continued Interactivity

The key difference between Internet commerce and wireless commerce is consumers can continue their interaction with any aspect of their commercial activity – whether searching for information, exchanging information or data, and transacting business –

irrespective of their location and movement. This makes it ideal for *dynamic* transactions where continued interactivity is very essential and useful – participating in auctions and exchanges (stock trading, for example), playing interactive games with others (which is a significant use of wireless in Europe and Japan), chatting and instant messaging, etc. Besides providing additional opportunities for getting consumers’ attention when they are involved in such dynamic transactions, the possibility that consumers’ will show a higher involvement in their activities may also translate to more involved attention to advertisements directed at them. This can be a significant advantage over the Internet medium, where banner advertisements thus far have failed to get significant consumer attention [3]. On the other hand, it could also be argued that when consumers are avidly involved in conducting dynamic transactions over the wireless medium, unsolicited advertisements could be viewed as being too intrusive and thus turn-off consumers. We argue that the key factor that will determine whether or not such outcome results, is the relevance of the advertisement to the transaction activity that consumers are involved in. While the Internet medium is “transaction aware” (that is, companies can surmise what activities consumers are performing at a given time), wireless is “transaction aware” as well as “location aware” (that is, companies can pin point what location the consumer is at). Thus, the wireless medium can be better used to push relevant advertisement messages to consumers with greater success rate than in the Internet medium.

Proposition 4: Given the continued interactive nature of activities in the wireless medium, relevant advertisement messages will have a greater success rate in the wireless medium as compared to the Internet medium.

The success rate itself could be measured on the basis of many metrics such as ad recall (aided and unaided) and click-through rates. A concrete example of an activity, which requires continued interactivity, is interactive games that have become a phenomenon in countries such as Japan. A game called FISH, which is a multi-player, pocket game is highly interactive and addictive and has 6.92 million subscribers, with the subscriber base growing at the rate of 20,000 per day (Yahoo News, May 22nd 2000). It is the addictive nature of these games that make them a potentially good vehicle for communicating advertisements. In fact, there are several wireless application organizations that are exploring the business model of providing free game time in exchange for viewing advertisements on wireless devices. While it is possible that such schemes may attract bargain-hunters, it may be quite successful with certain demographic groups such as teens and young adults that the first-movers may have a viable business model. However, from a marketing

viewpoint, it remains to be seen whether continued interactivity translates to higher attention for advertisements.

3.4. Feedback at the Point of Usage/Purchase

In as much as wireless can be used to provide information to consumers at the point of their need, it can equally be well used to obtain feedback from consumers at the products/services' point of usage or purchase. The "location aware" and "continued interactivity" features of the wireless environment are an added advantage when it comes to obtaining information from consumers. There are two main uses of such feedback, one for marketing research purposes, and the second for customer service purposes.

3.5 Marketing Research Implications

3.5.1. In-Situ Market Research Marketing research techniques always have to contend with reliability and validity issues in obtaining feedback regarding products and services from consumers. In many instances products and services are used in homes, offices, or in outdoor settings etc. and in obtaining feedback from consumers on these usage experiences there is generally a time delay and market researchers have had to rely on consumers' memory and recall abilities. This leads to higher chances of reliability and validity problems in such surveys. With wireless, it possible to obtain instantaneous feedback from consumers as they are using the product/service at whatever location, thereby reducing the problems that arise from recall situations. For example, a diaper manufacturer could provide incentives to participating parents to provide instantaneous feedback while changing diapers at home, or outdoors as they travel, when specific issues regarding the usage of the product could be more reliably measured. It is possible to set up omnibus panels for such purposes and for focus groups, conjoint studies, etc., with appropriate incentives for providing feedback. This could be a cost-effective way of capturing reliable usage feedback in lieu of experiments with potentially larger sample sizes and realistic usage settings.

3.5.2. Market Research in Brick-and-Mortar Environments. One of the significant trends in consumer marketing is the emergence of multi-channel marketing of products and services. Organizations are using direct channels such as the Internet and catalog channels and other channels such as brick-and-mortar environments, either to seamlessly integrate their offerings across all channels, or use these different channels to segment consumers and implement differential marketing strategies. In such cases, it is necessary to measure the

effectiveness of marketing strategies across the different channels using marketing research techniques. In fact, a number of marketing research organizations provide such integrated analysis of activities across these channels (for example, e-satisfy.com). However, because of the disparity of technology used across these channels, several problems arise. For example, consider a spectrum of channels ranging from the Internet channel on one end to the B&M channel at the other end.

Internet	B&M
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As one moves from the Internet environment to the B&M environment,

- a. Richness of information and granularity decreases precipitously as you reach the B&M end of the spectrum
- b. Ease of sampling reduces
- c. Accuracy of the sampling frame decreases
- d. Cycle time of processing information increases, from several times a day to weekly/monthly reports
- e. Cost per respondent in studies are significantly higher in the B&M case

Wireless technology can significantly reduce such disparities. For example, assume that Bluetooth (a popular wireless technology) is used in a B&M retail store as an integral part of the ordering and transaction process – a wireless hand-held device with Bluetooth technology that transmits consumers' actions, be it purchasing, viewing, etc, directly to checkout so that buying process becomes more efficient. Such a technology in a B&M environment can be lead to several advantages:

- a. In addition to enabling efficient transactions, it can be used to provide personalized service (the consumer's ID is available from the wireless device)
- b. It can be used for dynamic promotion and pricing – electronic coupons as consumers shop, quantity discounts, auction pricing for certain items (bidding against other shoppers), etc.
- c. One could track movement of consumers across aisles as they shop
- d. Marketing research techniques such as in-store experimentation on effectiveness of promotions, display and aisle adjacencies is a possibility
- e. One could measure and increase effectiveness of cross-category promotions
- f. Useful for conducting spot surveys in-front of products stocked as consumers interact with the product and make their buying decisions. This enables the combining of attitudinal and behavioral data at significantly lower cost.

This leads us to the following general proposition:

Proposition 5: Use of wireless technology can lead to more efficient and effective marketing research techniques at significantly reduced cost.

3.6. Customer Service and Personalization Implications

The following customer service possibilities suggest themselves on the basis of the extensive discussions we have had thus far:

- a. customer service in site at the point of need – online manuals and self-help
- b. customization based on identification of consumers much in the same way we have on the Internet, but with a wider coverage to include B&M settings

There is a concern regarding privacy in the wireless environment similar to Internet environment, may be even more in magnitude. In our view, the solution is the trust that consumers have with organizations.

4. Conclusions

It is clear that much of what we have discussed in terms of the possibilities can become reality only if (1) advancements in wireless technology, standards, and infrastructure keep pace with the business expectations, and (2) the propositions that we have advanced test out to be true. With regard to the technology, there is ample evidence that wireless application organizations have been working towards making the possibilities a reality. For example, Advertising.com has developed a model to stream personalized advertisements to WAP wireless devices. Bluelight.com has been working with direct marketers to get KMart's "bluelight" specials to consumers' wireless devices [4]. The propositions we have advanced will also be tested in the meanwhile as organizations grapple with the issue of a viable business model to capture the emerging wireless commerce market. These could be in the form of organizations trying out various schemes to get consumers' attention for advertisements – using free games, auctions, etc – a real life experimentation of the marketing ideas. But the testing could also be done in controlled experimental settings. Our research agenda encompasses some of the latter ideas. First, we are working with wireless application developers to test the power of activities that require continued interactivity (games and auctions) in holding consumers' attention for advertisements. This study will be conducted in controlled setting – with varying activities, with varying advertisement content, with varying demographic segments. Second, we are working with market research organizations in using

wireless technology to design omnibus panels of consumers to provide feedback at the point of purchase and usage. This study will compare the reliability of measures used in such settings versus the reliability of feedback obtained through conventional means (with time delay). These are only a few of our plans to study the issue of marketing in the wireless environment. Many other research ideas suggest themselves from the discussions we have in this paper. We hope that this paper can contribute in a small way to stimulating further research in this important area.

5. References

- [1] Aberdeen Group, "A New Era of Mobile Business Applications," White Paper, April 2000, www.aberdeen.com
- [2] Hamalainen, Matti, "Towards Interactive Content Creation and Delivery" presented at the Wireless Agenda 2000, University of Texas Wireless E-Commerce Workshop, Austin, Texas, May 25, 2000, available at <http://crec08.bus.utexas.edu/WirelessWorkshop/>.
- [3] Internet Advertising Report, May 12, 2000, www.Internetnews.com
- [4] Internet Advertising Report, June 16, 2000, www.Internetnews.com
- [5] Kannan, P. K., "The Impact of Wireless Technology on Marketing Research," presented at the Wireless Agenda 2000, University of Texas Wireless E-Commerce Workshop, Austin, Texas, May 25, 2000, available at <http://crec08.bus.utexas.edu/WirelessWorkshop/>.
- [6] Ovum Online, Mobile E-Commerce: Market Strategies, May 2000, www.ovum.com
- [7] Whinston, Andrew B., "Wireless Meets the Internet Economy," Key-Note Speech at the Wireless Agenda 2000 Conference, Austin, Texas, May 24, 2000, available at <http://crec08.bus.utexas.edu/WirelessWorkshop/>.