NEW PERSPECTIVES ON M-COMMERCE RESEARCH

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ABSTRACT

This paper summarizes the progress and the future directions of m-commerce research. Despite the rapid proliferation of Internet-enabled mobile handsets, empirical research has been undertaken only in a limited number of research areas. Important progress has been made in mobile Internet and SMS-based mobile advertising adoption, but other important topics, such as e- commerce and m-commerce comparison, mobile-based word-of-mouth, and methodological issues, have rarely been addressed. Future studies should explore these areas. In closing, the seven contributions to this Special Issue are introduced.

Keywords: IT management; M-commerce; Marketing; Wireless communication

1. Defining M-Commerce

The Internet-enabled mobile handset has rapidly achieved worldwide penetration, due to its very personal nature and sophisticated communication technologies. However, unlike e-commerce research, empirical explorations of m-commerce have seen only modest growth, because of the considerable uncertainties involved in mobile research. One major problem in m-commerce research is the lack of standards in terms, concepts, and theories. Although the infrastructure of wireless technology varies across markets, researchers tend to use the term "m-commerce" without considering the specific conditions and prerequisites of what they are examining. In addition, industry participation in academic research is at best occasional, and, in many cases, rapidly developing mobile technology may not be accepted as much as practitioners expect: either because of the higher cost per service ratio, or simply because these services can easily be replaced by the wired Internet.

Current mobile Internet applications enable consumers to access a variety of services: Web information search, SMS (short message services), MMS (multimedia message service), banking, payment, gaming, emailing, chat, weather forecast, GPS (global positioning service), and so forth. Collectively, we denominate this wide array of services as "m-commerce." However, a clear distinction between m-commerce and PC-based electronic commerce has rarely been made.

In a narrow sense, m-commerce can be defined as "any transaction with a monetary value that is conducted via a mobile telecommunications network" [Durlacher 1999]. Sadeh [2002] characterizes m-commerce more broadly, as "the emerging set of applications and services people can access from their Internet-enabled mobile devices." Typically, m-commerce takes place in a strategic platform called a "mobile portal." There, third-generation (3G) mobile communication systems offer a high degree of commonality of worldwide roaming capability, supporting a wide range of Internet and multimedia applications and services with higher data rates.

From the perspective of marketing, Nysveen, Pedersen, and Thorbjornsen [2005] propose a grid of mobile Internet services classification that employs four primary axes: person-interactive versus machine-interactive, and goal-oriented versus experiential services. Figure 1 is an adapted version of this classification scheme.

	Goal-Oriented	**Experiential**
Person-interactive	Information	Messaging
Machine-interactive	Payment	Gaming

Adapted from Nysveen, Pedersen, and Thorbjornsen [2005]
Figure 1. Classification of mobile Internet services.

"Person interactivity" occurs between people through a medium, while "machine interactivity" refers to the interaction between people and the medium. In the latter, users can freely modify the content and form of a mediated environment. A goal-oriented process is defined by utilitarian benefits, while an experiential process provides hedonic benefits.

This classification grid offers a key to understanding the future research directions of m-commerce. That is, future research should clearly define process characteristics, and the type of interactivity, in order to provide the audience with clear implications regarding a specific mobile service. In particular, very little research has addressed the question of interactivity in mobile devices, although it has been argued that mobile technology is an alternative way to connect to the Internet (i.e., wireless Internet).

2. Progress in M-Commerce Research

To date, major e-commerce journals and some business journals have published special editions on this topic: the first was in *Electronic Markets* in 2002, followed by *International Journal of Electronic Commerce*, *Decision Support Systems*, and *Journal of Business Research*, amongst others. The focus of the journals varied, from technical to managerial topics, and exemplified the complex nature of m-commerce components.

A series of papers by Barnes [2002a, 2002b] were among the pioneering efforts in mobile research in general. He proposed preliminary frameworks for value-chain creation and wireless advertising, respectively. His works are purely conceptual, but his frameworks provided a useful foundation for those who subsequently undertook empirical explorations.

Needless to say, mobile Internet service adoption has been the most popular topic in the m-commerce research literature. To date, several empirical studies are available, including Hung, Ku, and Chung [2003]. They conducted one of the most comprehensive studies of mobile Internet adoption, adopting Davis's [1989] Technology Acceptance Model (TAM) to consumers' WAP adoption behavior in Taiwan.

From a theoretical point of view, the TAM has been the most frequently used base for m-commerce adoption, followed by the Theory of Reasoned Action (TRA) [Fishbein and Ajzen 1975] and the Theory of Planned Behavior (TPB) [Ajzen 1991]. For example, Lu, Yu, Liu, and Yao [2003] proposed a TAM-based conceptual framework for wireless Internet adoption. This is not surprising, given that this theory has frequently been used to study wired Internet adoption.

Nysveen, Pedersen, and Thorbjornsen's recent exploration [2005] may—in my judgment—become one of the most significant contributions to date on mobile Internet adoption. The study was carried out in Norway, and partially replicates Hung, Ku, and Chung's study. Nysveen, Pedersen, and Thorbjornsen formulated a causal model based on the TAM, TRA and TPB, to examine cross-service comparisons via multigroup structural equation modeling.

SMS-based marketing is another "main stream" of m-commerce research. For example, Barwise and Strong [2002] and Tsang, Ho, and Liang [2004] provided solid empirical evidence regarding "permission-based" advertising in the UK and Taiwan, respectively. On the other hand, although sporadic industry reports indicate actual use of SMS campaigns, there have been few attempts to investigate multinational firms' strategic perceptions of mobile marketing. Okazaki [2005] conducted a qualitative interview of 54 multinational firms' marketing executives operating in Europe. This study was based on Roger's [1980] new technology diffusion model, and found that multinational firms consider branding one of the most important attributes of mobile advertising adoption.

Few researchers have examined the specific nature of mobile Internet services, and the studies have been published in a rather sporadic way. For example, the literature is available in mobile banking/finance [Brown et al. 2003; Kleijnen, Wetzels and de Ruyter 2004, etc.], cross-cultural comparison [Lee et al. 2002, etc.], security issues [Petty 2003, etc.], and location-based services (GPS) [Kumar and Stokkeland 2004, etc.], among others.

Kleijnen, de Ruyter, and Wetzels [2004] published an interesting study of mobile gaming adoption in the Netherlands. They applied a series of sophisticated multivariate analyses to examine mobile gamers' profiles. Their paper is one of the few empirical studies of this topic. In a recent study, Kleijnen expanded her expertise into the more psychological aspects of new technology adoption [2005], an approach that seems to provide insightful implications for future m-commerce research.

From the industry perspective, one of the most successful mobile Internet services, i-mode, has seldom been examined empirically, although Baldi and Thaung's [2002] conceptual studies explained its adoption process from cultural perspectives. In the same token, Barnes and Huff [2003] used the TAM framework in their theoretical paper. Okazaki [2004] conducted an empirical study of a pull-type advertising platform on i-mode. His proposed model was based on uses and gratifications theory and on Dacoffee's [1996] Internet advertising value model. His findings suggest informativeness, entertainment, and irritation are the three primary factors that influence consumers' intention to "click" text-banner ads in mobile platforms.

3. Research Agenda for M-Commerce

Given the preceding discussion, we can conclude that, although an evolving amount of empirical research is being undertaken in m-commerce, several important research areas remain unexplored. Table 1 summarizes the research agendas and their status. Although this list is in no way exhaustive, it is clear that the mobile Internet and SMS-based push-type mobile advertising/marketing are the two most studied areas. In contrast, empirical efforts have been scarce in other areas, but in particular, almost nonexistent in the following three areas: e-commerce versus m-commerce comparison, mobile-based word-of-mouth, and research methodology in m-commerce.

First, we have seldom addressed a fundamental question: whether m-commerce can be an effective alternative to e-commerce, or, to put it another way, whether there are any significant differences in their usage and consumer acceptance. However, little research has been concerned with these questions. The wireless Internet has many similarities with the PC-based Internet, but there are important differences in usage and adoption. First, in comparison to the wired Internet, the mobile is a very personalized device, because information flows from and to the device on a person-to-person basis only. Second, the mobile is by its nature a ubiquitous device, which consumers can use at any time and anywhere. Although the microbrowser screen cannot display complex product details, it has been demonstrated that in Japan m-commerce is an effective distribution channel for consumer goods (in particular, cosmetics, beverages, etc.) [Okazaki 2004]. Valid and reliable comparison of e-shoppers and m-shoppers will be a valuable decision making resource for both IT managers and online marketers.

Second, the mobile telephone is a very personal device, and therefore marketing information can be more easily transmitted by voice, messaging or email functions. Hence, word-of-mouth (WOM) can be achieved by wireless, and can replace person-to-person or PC-based WOM. We have as yet little knowledge of how consumers formulate such a WOM network with friends, family and community members, or how they send and receive product- or service-based information. Social norms or peer pressures may be important factors that influence such information networks or chains. Future research could focus on how consumers exchange useful and beneficial product/service information via the mobile Internet.

Lastly, although the majority of existing studies used paper-and-pencil or web-based questionnaires, we seldom question the validity of responses. Can we safely assume that respondents' self-reported answers are valid and reliable data for mobile research? Are web-based surveys valid when our interest is in fact in mobile users? Should questionnaires instead be sent via mobile devices? Otherwise, how can we assume that respondents are actual users of mobile Internet services? What are the costs and benefits of these alternatives? We need to discuss more issues related to the reliability and validity of m-commerce research methodology.

Table 1: Research agenda for m-commerce

Research agenda	Status	Available literature
Mobile Internet adoption	Abundant	Bertelé et al. [2002], Hung et al. [2003], Nysveen et al. [2005], etc.
Push-type (SMS-based) advertising/marketing	Abundant	Barwise and Strong [2002], Tsang et al. [2004], etc.
Mobile banking/finance/payment	Explored	Brown et al. [2003], Kleijnen et al. [2004], etc.
Security issues in m-commerce	Explored	Petty [2003], etc.
Location-based services	Explored	Kumar and Stokkeland [2004], etc.
Cross-cultural issues in m-commerce	Scarce	Lee et al. [2002]
Managerial perspectives in mobile Internet adoption	Scarce	Okazaki [2005]
Mobile gaming	Scarce	Kleijnen et al. [2004]
Pull-type advertising/marketing	Scarce	Okazaki [2004]
E- versus M-commerce comparison	Unexplored	?
Mobile-based word-of-mouth	Unexplored	?
Research methodology in m-commerce	Unexplored	?

4. Contributors to This Special Issue

This Special Issue includes seven excellent papers.

The first contribution attempts to examine a sophisticated causal model of Korean consumers' perceptions of mobile Internet usage. Lee included two crucial elements, interactivity and trust elements, and addressed a

fundamental question: why consumers make their decisions to access (or not) the wireless Internet via a mobile device.

Bauer, Barnes, Reichardt, and Neumann revisit consumer acceptance of SMS-based mobile advertising, in terms of consumer personality and advertising content. They formulated a research model based on the TRA, and found that entertainment and information are the two primary antecedents of consumer acceptance.

Bigné, Ruiz, and Sanz focus on the more practical aspects of "M-shoppers," and examined their profiles and purchase behavior. The findings are based on a large-scale survey of Spanish Internet users, and show the importance of demographic data, such as age, social class, and behavioral patterns, as determinants of shopping decisions via mobile. Given the almost non-existent research on the Spanish mobile industry, this constribution is a valuable addition to this special issue.

Harris, Rettie, and Kwan challenge one of the emerging issues in m-commerce research: cross-cultural comparison of consumer usage. They conducted an empirical study in the UK and Hong Kong, using Hofstede's cultural dimensions. Although English is widely spoken in Hong Kong, it seems clear that cultural heritage distinguishes British and Chinese consumers' mobile Internet usage.

Hosoe proposes an alternative consumer research technique in the postmodern era, the "Experience Sampling Method," by which images and messages are transmitted to, and recorded in, a database via mobile devices, and are used for real-time behavioral analysis. This breath-taking data collection method should help many researchers to obtain more valid responses from everyday consumption experiences. The paper presents several case studies carried out in Japan.

Muntermann examines the utility of automated mobile alerting services in the financial community. This paper is unique and creative, in that it proposes practical applications in a real situation involving private investors' information needs. How can we provide prompt decision support system via mobile so that consumers can react quickly to critical market events? In this research, Muntermann attempts to answer this question.

Finally, Pagiavlas, Stratmann, Marburger, and Young report mobile business opportunities and challenges in the U.S. airline industry. In collaboration with United Airlines and Siemens Business Services, they present interesting and useful case studies in the attempt to identify the crucial elements that expedite facilitating airline customers' convenience via mobile-based infrastructure. This paper exemplifies a fruitful collaboration between marketing academics and practitioners involved in m-commerce development.

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