

## **Editorial**

### **Special Issue on M-Commerce**

Today, mobile networks serve approximately three billion subscribers worldwide, a quantity that even exceeds the number of users connected to the Internet, which is estimated to be around one billion. This impressive coverage of mobile technology and still ongoing growth rates hold a great potential for new business opportunities in the area of Mobile Commerce or M-Commerce. M-Commerce deals with selling goods, services, and contents, including related functions like advertising and payment transactions, over wireless networks. The usage scenarios are very manifold and include, but are not limited to mobile banking, mobile entertainment, mobile gaming, mobile advertising, mobile ticketing, or mobile health. However, while the appearance of the Internet has been significantly coined by commercialization and related services during the last decade, M-Commerce is just an emerging market and hence still requires extensive research in various disciplines.

The idea behind M-Commerce goes back to the late 1990s, when the new economy started to create what today is known as the Internet bubble. Inspired by the new possibilities of the Internet on the one hand and mobile technologies emerging then on the other, M-Commerce was seen as another cash cow, which, besides various business initiatives in the wired Internet, seemed promising for creating tremendous revenues. As a consequence, the industry and standardization agencies have started developing required technologies, protocols, and services for M-Commerce, market analysts have identified a series of potential killer applications, and mobile operators in many regions of the world have spent enormous sums for licensing radio frequencies needed for establishing 3G networks. First M-Commerce services were then introduced around the turn of the millennium and mostly appeared as complements to existing E-Commerce services in the Internet.

Unfortunately, disillusion about the success of M-Commerce followed very rapidly when it turned out that most service offers were hardly accepted, apart from a few niche market applications, for example, selling ring tones. This insight was accompanied by the collapse of the Internet bubble, although reasons for this collapse and for the breakdown of M-Commerce must be considered differently. For M-Commerce, it can be stated that mobile users complained about low data rates, unreliable and expensive data services, and poor user interfaces when they tried to access the new services via their old-fashioned mobile devices with low-resolution monochrome screens and proprietary web browsers. The access to M-Commerce services was not only inconvenient and expensive, but the range of offered services was also very poor, because many mobile operators did not open their networks for third party service providers, which, however, is a major prerequisite for the creation of innovative services and competitive service markets. However, one of the most essential mistakes made is certainly that early M-Commerce initiatives were almost always driven by technology and business, and they did not sufficiently consider of what the users really want.

At this point, however, it must also be stressed that the situation was and still is quite different in the Asian-Pacific region, where first attempts in M-Commerce were much more promising, which is reflected, for example, by the success of the iMode service. When analyzing the reasons, many experts emphasize that innovation cycles are realized much faster there, and people's readiness for adopting new technologies is more pronounced than in other regions of the world. This is also an indicator that the creation of M-Commerce services should include an in-depth analysis of the demands of users, including their attitudes, habits, and mentality.

Fortunately, since the deployment of the first generation of M-Commerce services a lot of circumstances have changed positively. Obvious changes are due to the nearly seamless coverage of affordable mobile broadband data services and a sufficient market penetration of sophisticated mobile devices with high-resolution colour screens, fast processors, as well as advanced operating systems and virtual machines for executing dedicated client applications. In addition, new emerging technologies are now increasingly integrated into mobile devices and are converging with existing ones. Examples are GPS, RFID, and sensor technology, which allow to automatically capture the user's current location and activity, and thus to realize convenient M-Commerce services that adapt to the current user's situation.

This technological progress is accompanied by a better knowledge of the coherence among technology, business, and user demands. Lessons learned from first M-Commerce services include that it is not sufficient to establish them as simple alternatives or supplements to successful E-Commerce services of the Internet. Rather, new services, related business models, and transaction patterns have to be identified in order to acquire and serve customers on the move and to adapt services according to their current situation. It is well understood now that technologies and business demands are not the only driving forces for new M-Commerce services, because user demands and desires have to be considered in addition. However, understanding user demands is a complicated matter and includes the consideration of many aspects, ranging from individual preferences, privacy and security issues to personalization and human computer interaction. Therefore, to acquire and inspire the huge number of mobile subscribers for future M-Commerce services, the creators of services need to find new ideas and develop innovative

solutions and methodologies that bridge the gap between emerging technologies, innovative business models and user demands.

The purpose of this special issue on M-Commerce is to address these challenges and to present a snapshot of latest research and initiatives in this area. From 39 submissions we initially received, seven articles were selected for publication after a rigorous two-step review process supported by experts in the area of M-Commerce.

Three articles of this special issue deal with M-Commerce from a business point of view. The article "Australian Case Studies in Mobile Commerce" by J. O'Donnell et. al. describes a series of case studies, which cover different wireless projects of Australian companies. The authors clearly differentiate between mCommerce, mEnterprise, and mService projects, and investigate for each of these classes the underlying business cases, payment models, privacy and security approaches, as well as other aspects. The strengths and weaknesses of the projects are identified, and valuable recommendations for future projects are given. Case studies are also the methodology applied by the authors of the article "Motivations and Challenges for M-Business Transformation: A Multiple-Case Study". H.-S. Tsai and R. Gururajan have analyzed the motivations of several Australian companies for supporting their businesses by mobile technology. For this purpose, they interviewed the employees of different sectors, e.g., bank, education, and health care. The interesting results of this study are presented in the article, followed by a description of the major challenges one is faced with when transforming businesses into M-businesses. The article "Revenue Logics of Mobile Entertainment Software - Observations from Companies Producing Mobile Games" by R. Rjala et. al. focuses on the concrete application area of mobile gaming. Increasing computational power and multimedia capabilities of mobile devices accompanied by a lot of creativity turn this business into one of the most promising and exciting ones in the area of M-Commerce. The authors examine the revenue logics and associated distribution models, and analyze four case companies in the game sector by means of a conceptual framework.

Another two contributions in this special issue cover the user point of view. The article "Key Drivers of Mobile Commerce Adoption - An Exploratory Study of Spanish Mobile Users" by E. Bigné, C. Ruiz, and S. Sanz presents the results of interviews the authors have conducted with over 600 Spanish mobile users. The aim of this extensive study was to determine the coherence between parameters like usage habits of mobile devices, demographics, and attitude towards M-Commerce services and to identify the key drivers behind future M-Commerce services. The authors also explain the applied methodology behind the data analysis and draw important implications from their study. The article "A Conceptual Framework and Propositions for the Acceptance of Mobile Services" by S. Rao and I. Troshani presents a critical survey of models used for understanding and predicting the motivations that lead users to adopt mobile services. After identifying different criteria, for example, perceived usefulness and social influence, the authors reflect for each criterion the state of the art, discuss the pros and cons of different models and derive propositions for designing and realizing successful mobile services.

The technology part of this special issue contains two contributions. One of the key technologies of M-Commerce services, RFID, is subject of the article "The Future of Radio Frequency Identification" by A. Wong and D. Viehland. The authors do not propose a new technological approach or method, but highlight the potential as well as pros and cons of existing RFID solutions. For this purpose, they identified twelve issues related to this technology, among them data warehousing, performance, privacy, and standardization, and used them as a basis for a Delphi study, in which several experts in the area of RFID have been interviewed. The article presents and discusses the interesting results of this study. The article "A System for Locating Mobile Terminals with Tunable Privacy" by S. Bessler deals with M-Commerce services that make use of a user's location, for example, in order to compose and deliver a list of nearby shopping opportunities. The author proposes a method of how to save the privacy of users with regard to their locations, which is essential for the acceptance of such services. The proposed method is based on the Session Initiation Protocol and thus fits very well into the service architecture of future mobile networks.

We wish to take this opportunity to thank all authors who submitted their excellent manuscripts to the call for papers of this special issue, the paper reviewers, and the Editor-in-Chief of JTAER Narciso Cerpa for his valuable contribution and support. We hope that the readers find this special issue interesting and informative.

**Axel Küpper and Jerry Gao**  
**Guest Editors**

[axel.kuepper@ifi.lmu.de](mailto:axel.kuepper@ifi.lmu.de)

[jerrygao@email.sjsu.edu](mailto:jerrygao@email.sjsu.edu)

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