Critical success factors and business models for mobile and wireless applications

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Abstract: The proliferation of mobile and wireless communications technologies has recently paved the ground for the development and commercial deployment of a multitude of applications and services, such as location based services, mobile advertising, mobile banking, and mobile entertainment to name but a few. While many such services show initial signs of commercial success, research has yet to address the drivers and inhibitors of successful application deployment in a systemic fashion. This special issue sets out to contribute to the ongoing scientific debate surrounding mobile and wireless applications and services by reporting on recent advances in mobile business research and discussing their implications for the future.

Biographical notes: George M. Giaglis is an Assistant Professor of e-business at the Athens University of Economics and Business and Director of the ELTRUN Wireless Research Center. He received his PhD in Information Systems from Brunel University, UK. His research interests include mobile business, IT evaluation, and business process simulation. He has published more than 50 papers in major information systems journals and international conferences.

1 Rationale

Mobile business (*m-business*) is a term that has been coined to denote the ways in which mobile communication technologies can be applied to address the requirements of mobile users that need to access a varied range of applications and services through wireless access devices. Mobile business applications include, amongst others, *information and communication services* (e.g., assisted navigation, mobile yellow pages, and mobile advertising), *mobile transactions* (such as mobile shopping and mobile payments),

entertainment applications (for example, mobile games and mobile audio/video), as well as *business-to-business applications* (such as mobile supply chain management, mobile customer relationship management, and mobile workforce applications).

Despite the immense business potential of such applications, m-business is also characterised by a number of uncertainties and challenges, which have served to create a high-risk environment for entrepreneurial investment and strategy formulation. The uncertainties surrounding the future of m-business are not dissimilar to the ones of any new technology-driven and fast-growing application area. The absence of past data and the numerous possible future directions serve to create a complex landscape that is difficult to resolve even for the world's most highly acclaimed experts. Whilst technological developments and standardisation efforts proceed at a rapid pace, many business challenges pertaining to the deployment and management of value added services remain unresolved. There is considerable uncertainty as demand, competition, target markets, business models, and value added services still lack precise definition.

This special issue aims at contributing to the debate surrounding the present and the future of mobile business by publishing high quality original work identifying and studying mobile business research challenges. In line with the journal's scope, the emphasis of the papers published in this issue is on management and decision making related issues, rather than on technical ones.

The papers that appear in this special issue are revised and improved versions of the best papers that appeared in the *Proceedings of the Second International Conference on Mobile Business* (m-business 2003) that took place in Vienna, Austria in June 2003. After the conference, the best papers (as voted by the conference reviewers – where each paper was reviewed by two reviewers in a double blind fashion) were invited to submit a revised version for this special issue. In total, 15 papers were initially invited to submit.

All papers were subjected to a second double-blind review process, with three independent reviewers assigned to each paper. Based on the reviews received, six papers have been accepted for publication in the special issue. These papers were revised by the authors to address the comments of the reviewers, while the final editorial decisions have been the responsibility of the special issue's guest editor.

The papers present a good spread in topics covered, including:

- mobile decision aids for consumer decision-making

- consumer preferences for location based services

- drivers and inhibitors of mobile banking

- business models and service networks for mobile entertainment applications

- success factors for mobile advertising applications

- application-transparent adaptation in wireless systems beyond 3G.

2   The papers

The issue begins with a paper by Hans van der Heijden and Lotte Sangstad Sorensen of the University of Surrey, UK, titled 'Observations on the use of mobile decision aids for consumer decision making'. In this empirical work, the authors report the results of an experiment aiming at studying the behaviour of users in a mobile shopping scenario.

In particular, the work addresses the extent to which mobile decision aids can be helpful to shoppers engaging in product evaluations and selections. Technology-aided shopping, especially in the form of decision support systems embedded in mobile devices, may be a promising application of the future retail shopping experience, hence the results of this work are quite interesting and topical. In particular, the authors' conclusions regarding the utilitarian and hedonic value of the mobile shopping aid, as perceived by the experiment participants, may be of great value to designers of mobile shopping services as well as to retailers that wish to incorporate mobile decision aids in their service offerings.

In a similar vein, Frank Kohne of the University of Hohenheim, and Carsten Totz and Kai Wehmeyer of the University of Muenster, Germany, provide a paper titled 'Consumer preferences for location-based service attributes: a conjoint analysis'. In this work, the authors explore the applicability of conjoint analysis as a technique to elicit consumer preferences for location-based service (LBS) attributes. Their work addresses the concerns of LBS service designers who, not unlike the designers of other innovative services, cannot readily rely on comparable prior user experiences to identify critical attributes that will drive consumer behaviour when selecting and using LBS. Conjoint analysis is evaluated in an experimental setting where consumers have been asked to evaluate a fictitious mobile location-sensitive tourism application. The results, further to demonstrating the potential of conjoint analysis as an applicable consumer preference evaluation method for LBS, show that an appropriate pricing scheme, coupled with the characteristics of the mobile device, form the basis upon which consumer behaviour against the service is largely determined.

Turning to the domain of mobile banking, Mari Suoranta, Minna Mattila, and Juha Munnukka, all with the University of Jyvaskyla, Finland, provide us with 'A study on the drivers and inhibitors of mobile banking'. Their study took the form of a quantitative survey yielding more than 1250 responses from Finnish mobile banking customers. Drawing on the analysis of the survey findings, the authors propose a model that conceptualises drivers and inhibitors of mobile banking services. Based on this model, anytime/anywhere access to account information is one of the major drivers of mobile banking adoption, while functional elements (such as the inappropriateness of the mobile phone as a delivery medium for banking services) may inhibit the adoption of mobile banking. It is interesting to note that the accelerating pace of development acts both as a driving and as an inhibiting factor for different segments of the customer base. Indeed, knowledgeable and demanding customers favour the state-of-the-art provisions of mobile banking applications, while other customers may feel frustrated by services that are launched too early in their development cycle (apparently for competitive reasons) and hence quality and utility may be lower than anticipated. The results are of particular importance to designers of mobile financial services as they point to critical factors for service adoption, as perceived by the end users themselves.

Carleen Maitland of the Pennsylvania State University, USA, together with Elizabeth van der Kar and Harry Bouwman of the Delft University of Technology and Uta Wehn de Montalvo of TNO, The Netherlands, discuss 'Mobile information and entertainment services: business models and service networks'. The starting point of their work is the acknowledgement that the emerging mobile industry is too complex for firms to possess all necessary know-how and assets to compete on their own, especially for delivering mobile information and entertainment services. Hence, it is expected that such services will typically be provided through inter-organisational partnerships

(service networks). The authors analyse data from five case studies of such networks, in Germany, The Netherlands, and Sweden, to examine the influence of revenue models and network membership benefits on network characteristics. Their results indicate that revenue models are strong determinants of the network governance structure and that the more distant the network is from the end user the more differences can be observed in the revenue models (revenue sharing agreements) followed. Furthermore, learning appears to be a strong motivator for a firm entering a service network, although a direct relationship between expected benefits and network governance structure was not observed.

The next paper is titled 'Mobile advertising: an analysis of key success factors and the European value chain' and is authored by Antonello Facchetti, Andrea Rangone, Filippo Maria Renga, and Alberto Savoldelli, all with the Politecnico di Milano, Italy. The paper identifies a surprising lack of research into the industry and value chain dynamics of the mobile marketing industry, despite the fact that mobile marketing is perhaps one of the first market-penetrating applications of m-business. The authors base their analysis on data from 13 case studies of European mobile marketing organisations in an attempt to analyse the industry, identify emerging value chain structures, and define the critical factors for future market success. Their findings suggest that new business models have to be developed that cross the boundaries between mobile marketing and traditional marketing activities to exploit the complementary nature of the mobile phone as a marketing channel. The authors also point out to issues of expectations management, privacy concerns, inter-firm networking, and industry self-regulation as critical factors for future success.

Finally, of a more technical nature, the last paper is titled 'Application-transparent adaptation in wireless systems beyond 3G' and it is authored by Nikos Houssos, Vangelis Gazis, and Athanassia Alonistioti of the University of Athens, Greece. The authors identify a pressing need for developing application-transparent adaptation mechanisms in next-generation mobile and wireless systems to cope with the variety of contexts and platforms under which users are expected to access such applications. Addressing this need, the authors propose a deployment-time adaptation function that is capable of automatically generating a single downloadable application package tailored to the corresponding user request context. Although the mechanism addresses only a specific case of application-transparent service adaptation, namely the automatic generation and deployment of application bundles that are customised to the mobile terminal, the work shows the way to more sophisticated service adaptation approaches that will undoubtedly be required as beyond-3G mobile systems are being developed and as users expect to enjoy seamless access to services through wired, wireless, and mobile means.