

Handbook of Research in Mobile Business: Technical, Methodological, and Social Perspectives

Second Edition

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This opening chapter of the handbook approximately highlights the most important aspect of any technology to business – and that is “value”. Value of mobile technologies in business accrues when the technology is applied in the economic as well as social dimension of the business. Younessi, through his unique style that combines theory, research, and practice, highlights this importance of mobile technology and its relevance in creating sustainability in business. The long-term strategic approach of all modern businesses needs to incorporate location and time independence as a fundamental that is provided by mobility. This chapter will provide the reader with an excellent understanding of what is implied by the term “value” in the context of mobile business, its variations such as utility value, exchange value and essential value, and a mathematical background for calculation of value. The chapter finally concludes with identification and optimization of organizational goals in the context of mobility.

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The fundamentals of business economics and decision making are quite close to the theory of games. Therefore, it is only appropriate that game theory is used in providing tools, technologies, and applications that deal with business decision making. Mobile technologies and the resultant location-independence have immense potential to improve business decision making. The reason for the importance of game theory in the context of mobile business and technologies is the fact the game theory deals primarily with distributed optimization. This distributed optimization implies the opportunity for an individual user to make his or her decision in their own time and space. This chapter is an excellent introduction to strategic utilization of mobility as it considers the fundamentals of game theory and its demonstration in mobile business and technologies.

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Collaboration between businesses is the key to the future of the economic environment of the future. Mobile technology provides and enhances the ability of businesses to collaborate with each other. However, this collaboration becomes unique and challenging when there are numerous small and medium enterprises (SMEs) involved

in that collaboration. While collaborations hold the promise for global reach in a connected economy, there is a need to have a formal approach to transforming those organizations to mobile collaborative organizations. Mobile transformation was proposed by the author in the previous edition of this book. In this chapter, Marmaridis does an excellent job of presenting a research-based methodology for mobile collaboration (M-Collaboration). This chapter examines the challenges of mobile collaborations including trust, engagement, and interaction. This chapter provides the reader with a comprehensive understanding of mobile collaboration in the SME space and a field-tested mobile collaboration methodology for SME transformations.

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Jhoanna Rhodette Pedrasa, University of New South Wales, Australia

Eranga Perera, National ICT Australia, Australia

Aruna Seneviratne, National ICT Australia, Australia

The authors in this chapter, discuss one of the most significant aspect of mobile technologies – that of “context”. While mobility is touted as the key technology that enables location-independence, this value of this location-independence to a user is based on his or her context. It is the context that makes a mobile application relevant to the user. This chapter takes the reader through a definition and discussion on what is implied by context and how context can be used in mobile systems. The challenges to context-aware mobility management are discussed next and the existing solutions to those challenges are surveyed. However, the authors then present their own architecture for handling context in mobile solutions.

Chapter V

Assessing the Future of Location-Based Services: Technologies, Applications, and Strategies..... 45

Robert Harmon, Portland State University, USA

Tugrul Daim, Portland State University, USA

Location-based services (LBS) through the use of mobile technologies in business are based on the ability of mobile technologies to be able to provide value at a specific location of the user. The popularity and utility of LBS has lead to phenomenal technological infrastructure including networks, applications, and processes. However, at the same time, there are increasing challenges emerging due to the operational models of cellular network operators. These operational models provide competition between the operators, service providers, and enablers. Therefore, even though the customers are increasingly interested in location services, their uptake is stunted due to the competitive operational models of the network operators and service providers. Harmon and Daim do an excellent job, in this chapter, of evaluating the future of location-based services through a discussion and critical assessment of mobile technologies, service provision, mobile applications, the current market trends, and the issues related to strategic approaches in application of mobility in business.

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Mobile enterprises adopt mobile technologies in a strategic manner. This adoption of mobility by enterprises, however, needs to follow a process. A mobile enterprise transition framework provides this process for transition that is based on the meticulous consideration of the factors that affect transition. This chapter outlines a Mobile Enterprise Transition (MET) framework, for transitioning an organization to a mobile organization that is based on the dimensions of economic, technology, process, and sociology. These four dimensions for MET have been identified based on an understanding of people, processes, and technologies, and developed further as a comprehensive framework based on a detailed research project undertaken by the author. The purpose of this MET framework is to provide guidance and support that increases the chances of the transition’s success as well as ameliorate associated risks.

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Mobile collaboration is of ever increasing importance to business. Web Services (WS) technologies create the potential for an organization to collaborate with partners and customers by enabling its software applications to transact over the Internet. Mobile Web Services (MWS) take this collaborative ability of businesses a step further by making it location-independent. A vital element of this transition of organizations to collaborative organizations is a mobile process. A mobile process makes use of MWS as well as a mobile-enabled Service Oriented Architecture (SOA) for the enterprise. This chapter describes how the existing business processes of an organization are transitioned in to collaborative business processes that would result in a mobile Collaborative Web Based System (CWBS). This incorporation of MWS in a collaborative system happens at three interrelated yet distinct layers: policies, activities, and standards. This chapter develops these ideas and also presents the validation of these ideas through an action-research carried out by the authors in a large energy supplier organization in Melbourne, Australia.

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Mobile technologies result in a collaborative business environment in which the businesses are able to interact with each other in a location-independent manner. The business processes based on mobile technologies need to be modelled, studied, and optimized in order to create value to the collaborative businesses. This chapter describes an action research study in a security organization wherein the impact of mobile technology is studied and validated for collaborative business processes in a security business. The chapter, thus, describes a Collaborative Web Based System (CWBS) that is specific to the security organization. Furthermore, this chapter also highlights the shortcomings of the existing security related processes and how they can be improved with mobility.

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Keith Sherringham, IMS Corp, Australia

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The Internet wave that swept through business is likely to be seen as a ripple in a pond compared to the changes that are predicted from the adoption of mobility into business. Irrespective of industry sector, the mobile enablement (wrapping business around mobility) of business is expected to bring many opportunities and rewards; and like the Web enablement (wrapping business around the Internet) of business, a few challenges as well. Across all business areas, mobile business will need to support a mobile workforce, the operation of call (service) centres, and transaction processing and collaboration of virtual teams. Mobile business will also impact product offerings, the management of consumer choice and the focusing of communications with a sticky message. Mobile business will drive changes in management, revisions of business operations and the alignment of Information Communication Technology (ICT). This chapter discusses some of the common but important strategic elements to the successful mobile enablement of business.

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Mobile business strategies help businesses make optimum use of mobile technologies as the prevent over spending or under utilization of the potential of mobile applications. A mobile strategic framework, as described in this chapter, provides the businesses with the necessary guidance in terms of approach, adoption, and operation of mobile applications. This chapter also discusses examples of mobile solutions which have been implemented in hospitals, retail Supply Chain Management (SCM) and in Customer Relationship Management (CRM). The mobile framework discussed here by Pg Hj Ali and Atkins is an extension of existing Intranet, Extranet, and Internet e-business application with mobility.

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Mobile computing is getting more and more attention these days, but the fact that there is still inadequate source of methodology to support mobile development, triggers the interest in this study to explore issues related to mobile development methodologies. The mobile developers are facing formidable challenges in the development of mobile application due to the specific demand and technical constraints of mobile environment. Selecting a suitable development methodology is believed to be the key answer to all these issues. Thus, this study aimed to propose a solution to resolve the issues. A decision matrix based on Pugh method was constructed to assist mobile developers especially the novices, to choose the methodology that suits the requirements of their mobile development projects. In order to rate the usefulness of the constructed matrix, an electronic version of the matrix was designed and developed, called md-Matrix. Detail descriptions of the processes involved in constructing the matrix and designing the electronic version of the constructed matrix are also described. Analysis of data gathered from a questionnaire given after the test of md-Matrix shows that participants fairly agreed that md-Matrix is useful in helping them to develop a mobile application.

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Syamsul Bahrin Zaibon, Universiti Utara Malaysia, Malaysia

Sobihatun Nur Ab Salam, Universiti Utara Malaysia, Malaysia

Studies on the use of mobile payment (m-payment) method for buying electronic book (e-book) are very scarce, possibly not yet available. Consequently, a study was undertaken to accomplish the main aim of proposing an m-payment model for marketing and purchasing e-books. A number of process flow models are proposed to serve as diagrammatic representations of the process models that are of concerned. The models clearly specify all the entities involved, such as Telco, merchants, buyers, and e-book providers, and how the data and transactions, are flowing from one entity to another. The processes of browsing, buying, and downloading e-books are also documented. In validating the process flow models, two prototypes, a WAP and WEB environments, were developed and tested to assess the model and system acceptance rating. Key findings indicate that m-payment is the most preferred payment method for buying e-book in higher learning institutions and the acceptance factors of such technology were found to be on the high and positive side.

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Dinesh Arunatileka, Freelance, Sri Lanka

This chapter describes marketing strategies in concept for wireless broadband services in the Sri Lankan market. It also emphasizes different technologies offering fixed and mobile broadband services. Wi-Fi services which are mentioned here has been on offer for few years but actual marketing of such services are not actively done in Sri Lanka. Various marketing strategies that could be used to market this technology are also analyzed to gain an insight to all readers. In addition, a grid is provided to help readers to choose between different available technologies.

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Amit Lingarchani, University of Technology, Sydney, Australia

Mobility has a major impact on the collaborative abilities of business processes. This chapter discusses an approach to extending the collaborative business process model with mobility. Furthermore, this chapter also demonstrates how the mobile collaborative approach works in the “Medical Tourism” industry. Specifically, this chapter considers the booming Medical Tourism industry in India, which combines the travel of a person from a typical western nation (such as United States, United Kingdom, or Australia) to India to carry out a medical procedure (such as a heart operation) which would otherwise take a long waiting time and/or cost in multiples. There is a corresponding need and opportunities for collaboration between various available services like lodging, transport, pharmacies, insurance, and hospital organizations. This collaboration is important for the business and also for the consumer – the patient and the caregivers associated with the patient.

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Rok Rupnik, University of Ljubljana, Slovenia

Mobile application development needs to handle the nuances of mobility as the process for development can be different. The mobile applications development methodology therefore needs to focus on the uniqueness of mobile applications, which is context-based computing. The mobile applications development methodology in this chapter is based on the research of the author that results in appropriate development phases and tasks which are carried out in order to produce a robust mobile application.

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Real Time Decision Making and Mobile Technologies 173

Keith Sherringham, IMS Corp, Australia

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Value of business decision making depends on the availability of the required data and information at the right place and right time. This availability of information results in what is understood as knowledge to the business. Information Communication Technology (ICT) has been used to discern knowledge from data which can then be effectively converted to wisdom by the decision makers. This chapter goes into the details of how mobility is ideally positioned to provide knowledge and wisdom to the business decision makers through the location-independent correlation between variously located data and information.

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Channel Optimization for On Field Sales Force by Integration of Business Software on Mobile Platforms 182

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Amit Nanchahal, Symbiosis International University, India

Mobile Sales Force Automation can enhance the ability of sales teams to streamline their sales, supply chain and distribution networks. The ability of mobility to optimize the sales processes is further capitalized, as discussed in this chapter, by integrating sales-related software applications on a common mobile platform for business software. This integrated mobile platform and its relevance to sales is the core theme of this chapter.

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Mohammed Maharmeh, University of Western Sydney, Australia

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Mobile application development can succeed only when it is supported by corresponding software development processes. The authors have discovered that no one particular type of software process (such as waterfall, iterative, rapid, or agile) is suitable exclusively for a development project. This chapter presents the use of Composite Application Software Development Process Framework (CASDPF) that brings together the best of each of these types of processes for Mobile Applications Development.

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Carol Charsky, TWU, School of Management, USA

Mahesh Raisinghani, TWU, School of Management, USA

This chapter is based on the need to have a strategic approach to incorporate mobile devices and their corresponding software and applications in an organization-wide strategy. The literature in this chapter deals with the common mobile devices, their operating systems and their critical applications. This literature study provides further basis for how to balance budgets and goals with the available mobile technologies in a strategic manner.

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Mobile technologies provide enormous opportunities for globalization. Mobile enables location-independent connectivity that forms the core of the globalization strategy of any organization. This chapter discusses the importance of strategic approach to the globalization with mobile business that results in sustainable competitive advantage.

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Keith Sherringham, IMS Corp, Australia

Bhuvan Unhelkar, MethodScience.com & University of Western Sydney, Australia

The Model Driven Architecture (MDA) is an initiative of the Object Management Group (OMG) that considers visual modelling as crucial basis for future application development. This same MDA provides opportunity to deliver user driven solutions that unify solutions architecture, information management and business integration. MDA-based approach to mobile development is presented in this chapter together with some of the challenges and opportunities in using a business driven Model Driven Architecture approach.

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Murat M. Tanik, University of Alabama at Birmingham, USA

While Web services provide the opportunity to integrate various processes, mobile technologies create the opportunities to personalize them. This composite process-personalization (CPP) is nicely discussed in this chapter by Sadasivam and Tanik. In addition to the technical challenges, the CPP also addresses the need to model and integrate the interaction workers who drive the business processes. The chapter here outlines an agent-based approach to composite services development and demonstrates that approach in practice through a case study.

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Ralf Wagner, University of Kassel, Germany

Martin Klaus, University of Kassel, Germany

The “disruptive” nature of mobile technologies implies significant impact on the cultural aspects of a society. Conversely, the culture that is made up of the needs, beliefs and norms of a society also impact the usage of mobility. This chapter by Wagner and Klaus studies this significant cultural aspect of mobility by highlighting cultures’ differences and their consequences for the diffusion of mobile technologies in business and society, as well as its acceptance in mobile direct marketing and mobile commerce.

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The usability aspects of mobile gadgets play a crucial role in their acceptance by the users. Furthermore, this challenge of usability is exacerbated by the ongoing integration and convergence between mobile and wired networks and services. For example, the available bandwidth of a wireless connection, Web navigation on a wireless application and the various input-output methods for such applications are all part of the usability challenges of mobility – especially if the mobile applications are being offered on a common integrated platform. This chapter by Gurău takes a research-based approach in studying the challenges in terms of usability faced by mobile gadget users. The survey conducted for this chapter is based in the city of Montpellier in France.

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Ralf Wagner, University of Kassel, Germany

Martin Klaus, University of Kassel, Germany

Personalization of mobile devices opens up the gates for direct and focused marketing for businesses. Promotion of products and services has, thus, undergone a major revolution – with the mobile technologies providing appealing interfaces and presentations based on timing and location of the user. However, there is also a need to balance these advantages with the potential rejection and backlash by the customers if they consider this as an intrusion of their privacy. Wagner and Klaus discuss and demonstrate, with examples, this interesting aspect of direct marketing by businesses based on the mobile device usage in this chapter.

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Mobile Commerce Adoption in Spain: The Influence of Consumer Attitudes and ICT Usage Behaviour 282

Joaquin Aldas-Manzano, University of Valencia, Spain

Carla Ruiz-Mafe, University of Valencia, Spain

Silvia Sanz-Blas, University of Valencia, Spain

The chapter presents an excellent analysis of the influence of mobile user experience, ICT ownership, Mobile affinity, and Mobile Commerce compatibility in the Mobile-Commerce adoption processes. This chapter is based on an empirical study of 470 mobile users in the context of the Spanish market.

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Patrizia Grifoni, IRPPS-CNR, Rome, Italy

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Mobility and the Internet have revolutionized the tourism industry leading to novice ways of utilizing these communications medium, such as medical tourism discussed elsewhere in this handbook. This particular chapter by Guzzo, Ferri, and Grifoni outlines the use of mobile and Web technologies in coordinating a travel plan. For example, through a combination of mobile Web, the potential traveler can search for various options for his or her travel, plan the travel, buy the tickets, and actually undertake the travel with the potential for dynamically changing the travel plan. This chapter is thus an excellent addition to the discussion on the social implications of Web applications and mobile devices and how they positively impact the attitude of the customers that can result in sustainable tourism.

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Heikki Karjaluo, University of Oulu, Finland

Teemu Kautonen, University of Vaasa, Finland

Trust is, by far, the most important social aspect in adoption of mobility. This chapter by Karjaluo and Kautonen goes deeper into this issue of trust that affects the consumers' desire to offer their personal data in mobile marketing. This discussion in this research-based chapter is based on a sampled survey of 200 young Finnish consumers of mobility that lead the authors to conclude that the main source of trust affecting the consumers' decision to participate in mobile marketing is the company's media presence, rather than personal experiences or social influence.

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Fernando Ferri, IRPPS-CNR, Rome, Italy

Patrizia Grifoni, IRPPS-CNR, Rome, Italy

Mobile virtual communities affect all dimensions of life including education, travel, governance, and healthcare. This chapter is based on the impact of mobile virtual communities in the healthcare arena. Mobile virtual healthcare communities are the hub of information exchange amongst patients and physicians. This information sharing is helping in providing pre- and post-event support for the patients as well as exchange of relevant information amongst doctors and other healthcare professionals – as discussed here.

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Jigisha Gala, M.S. University of Baroda, India

Bhuvan Unhelkar, MethodScience.com & University of Western Sydney, Australia

Amongst the wide-ranging impacts of mobility on society, adolescents form a special and significant part. The authors in this chapter discuss this impact of mobility on the adolescent social structure including the parents, the teachers, peers/friends, and the young adolescents themselves. This chapter is based on a small research project to ascertain the views of the adolescents and the teachers of young adolescents within the Indian context.

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Heikki Karjaluo, University of Oulu, Finland

Matti Leppäniemi, University of Oulu, Finland

Jari Sall, University of Oulu, Finland

Jaako Sinisalo, University of Oulu, Finland

Feng Li, University of Newcastle upon Tyne, UK

This chapter discusses the mobile network as a new medium for marketing communications. It illustrates that the mobile medium, defined as two-way communications via mobile handsets, can be utilized in a company's promotion mix by initiating and maintaining relationships. First, by using the mobile medium companies can attract new customers by organizing SMS (short message service) -based competitions and lotteries. Second, the mobile medium can be used as a relationship building tool as companies can send information and discount coupons to existing customers' mobile devices or collect marketing research data. The authors explore these scenarios by presenting and analyzing a mobile marketing case from Finland. The chapter concludes by pondering different future avenues for the mobile medium in promotion mix.

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A Case Study of Sydney Airport 343

Keyurkumar J. Patel, Box Hill Institute, Australia

Wireless Technology is growing at a phenomenal rate. Of the many present challenges highlighted by the author, increased security is one of the main challenges for both developers and end users. This chapter presents this important security aspect of implementing a mobile solution in the context of Sydney International airport. After tackling initial challenges and issues faced during the implementation of wireless technology, this chapter demonstrates how security issues and wireless application were implemented at this mobile-intense airport organization. The decision to deploy and manage the wireless spectrum throughout the Airport campus meant that the wireless LAN had to share the medium with public users, tenants and aircraft communications on the same bandwidth. Therefore, this case study also demonstrates invaluable approach to protect unintended users from breach of existing security policies adopted by their corporate network. Authentication and data privacy challenges, as well as complete WLAN connectivity for tenants, public and corporate usage is presented in this case study.

Section III: Technology, Networks and Security

Chapter XXXIII

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B. Shankaranand, National Institute of Technology, India

Channel estimation is a technique to understand and optimize the behaviour of a communications channel. Identifying and improving on the accuracy of channel estimation can improve system performance in a wireless environment that can result and fast and reliable communications. This chapter discusses the critical and limiting challenges of communication channels and approaches to addressing them, such as the SISO estimation.

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The supply chains have become increasingly complex and interdependent in the globalization era. Regulatory authorities are demanding stricter customer compliance, and customers are demanding real-time data for better decision making. At the same time, customer demand is becoming more erratic thus the need for enhanced supply chain coordination with an objective to enhance overall customer value. Radio Frequency Identification RFID, an enabler of supply chain visibility, has the potential to provide customers with large amounts of information at any point in the movement of goods through the supply chain. This technology complements the barcode technology. However, with the acceptance of RFID technology, several managerial and technical issues arise. The focus of this chapter is to thus discuss the relevance of the RFID technology for enabling supply chain visibility and adoption related issues.

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Cell Broadcasting (CB) is a cellular-based public notification system that has immense potential usage mainly in emergency warning facilities, at the global level, CB can broadcast a text alert or message to a large number of people (independently of their network operators) specific to a geographical area, covered either by a single cell or by the entire (regional or national) network. The CB feature of modern mobile networks creates opportunities for management of natural and manmade disasters. This chapter analyzes options for further evolution in several sectors including political, technical, and regulatory perspectives.

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This chapter deals with the all important security aspect of mobility. Wireless transmissions include highly sensitive data that can lead itself to financial fraud. This chapter identifies and describes the issues surrounding the secure authentication of individuals attempting to access or transact with organizations using “wireless” online networks. This chapter then explains how to secure access to sensitive data with the use of multi-factor “out of band” authentication. Using CLEW, a mobile security product developed by the author’s company.

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This chapter describes mobile agents and their frameworks. While issues like latency factor, abrupt disconnection in service and minimal processing power appear to have been solved in the mobile agent paradigm, there is still a need to handle mobile transaction capabilities. This chapter deals with the use of mobile agent framework to

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One of the biggest challenges in future application development is device heterogeneity on varying mobile networks. This chapter presents a prototype for secure and reliable computing that addresses the issues and challenges in building multi-platform mobile applications that can run on heterogeneous devices. Furthermore, this chapter also describes how to allow a user to move/migrate a running application among heterogeneous devices that might be operating among different networks.

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Mobility in IP Networks 422

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Next generation telecom networks will be having convergence of the so called “Quad” functions voice, data, TU, and streamity on IP based mobility solutions. Mobile IP is a TCP/IP-based protocol that has been standardized by the IETF (Internet Engineering Task Force) for supporting mobility. Mobile IP is part of both IPv4 and IPv6 standards. Mobile IP works at network layer (layer 3), influencing the routing of packets and can easily handle mobility among different media. This chapter discusses different technical operations involved in Mobile IPv4 and Mobile IPv6 and compares them.

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This chapter aims to investigate and expand the role of mobile technologies in an Environmentally Responsible Business Strategy (ERBS). An ERBS with mobile technologies has the potential to help organizations achieve socially responsible goals of reducing green house emissions, reducing physical movement of men and materials, and recycling materials. This chapter delves deeper into the role of mobile technologies in creating and enhancing what can be considered as Environmental Intelligence (EI) – extending business intelligence with mobility for a Green enterprise.

Chapter XLI

Mobile Technologies Extending ERP Systems..... 440

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The majority of enterprises use Enterprise Resource Planning (ERP) software to improve their business processes. Simultaneously, mobile technologies which can be used within ERP have gained further importance. This is so because ERP, together with mobile technologies, offers a wide spectrum of synergies and have a significant impact on enterprise efficiency. The improvement possibilities in ERP due to mobility range from sales activities, over logistic processes, up to effects on the human resource management.

Chapter XLII

Techniques for Exploiting Mobility in Wireless Sensor Networks..... 445

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Arunita Jaekel, University of Windsor, Canada

A sensor network consists of tiny, low-powered, and multifunctional sensor devices and is able to perform complex tasks through the collaborative efforts of a large number of sensor nodes that are densely deployed within the sensing field. Maintaining connectivity and maximizing the network lifetime are among the critical considerations in designing sensor networks and its protocols. Conservation of limited energy reserves at each sensor node is one of the greatest challenges in a sensor network. It has been suggested that mobility of some nodes/entities in a sensor network can be exploited to improve network performance in a number of areas, including coverage, lifetime, connectivity and fault-tolerance. In this context, techniques for effectively utilizing the unique capabilities of mobile nodes have been attracting increasing research attention in the past few years. In this chapter, the authors will focus on some of the new and innovative techniques that have been recently proposed to handle a number of important problems in this field. They will also present a number of open problems and some developing trends and directions for future work in this emerging research area.

Chapter XLIII

Independent Component Analysis Algorithms in Wireless Communication Systems 456

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In commercial cellular networks, like the systems based on direct sequence code division multiple access (DSSS), many types of interferences can appear, starting from multi-user interference inside each sector in a cell to interoperator interference. Also unintentional jamming can be present due to co-existing systems at the same band, whereas intentional jamming arises mainly in military applications. Independent Component Analysis (ICA) use as an advanced pre-processing tool for blind suppression of interfering signals in direct sequence spread spectrum communication systems utilizing antenna arrays. The role of ICA is to provide an interference-mitigated signal to the conventional detection. Several ICA algorithms exist for performing Blind Source Separation (BSS). ICA has been used to extract interference signals, but very less literature is available on the performance, that is, how does it behave in communication environment. This needs an evaluation of its performance in communication environment. This chapter evaluates the performance of some major ICA algorithms like Bell and Sejnowski's infomax algorithm, Cardoso's Joint Approximate Diagonalization of Eigen matrices (JADE), Pearson-ICA and Comon's algorithm in a communication blind source separation problem. Independent signals representing Sub-Gaussian, Super-Gaussian and mix users are generated and then mixed linearly to simulate communication signals. Separation performance of ICA algorithms measure by performance index.

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A Case Study in the Installation of Wi-Fi Networks in a Chemical Manufacturing Unit in India 464

Bhargav Bhatt, Ultra InfoTech, India

This chapter describes a case study on installation of a Wi-Fi network in a chemical manufacturing company in India in order to connect its various dispersed manufacturing units, as well as the administrative offices. Initial studies indicated that a physical network was not appropriate due to the local corrosive chemical environment; the author's company was invited to install Wi-Fi network within the complex. This chapter reports on how the project progressed, the lessons learnt and the way to approach this kind of work in future in terms of wireless networking.

Chapter XLV

Social Context for Mobile Computing Device Adoption and Diffusion: A Proposed Research Model
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The purpose of this chapter is to explore and suggest how perceptions of the social context of an organization moderate the usage of an innovative technology. We propose a research model that is strongly grounded in theory and offer a number of associated propositions that can be used to investigate adoption and diffusion of mobile computing devices for business-to-business (B2B) interactions (including transactions and other informational exchanges). Mobile computing devices for B2B are treated as a technological innovation. An extension of existing adoption and diffusion models by considering the social contextual factors is necessary and appropriate in light of the fact that various aspects of the social context have been generally cited to be important in the introduction of new technologies. In particular, a micro-level analysis of this phenomenon for the introduction of new technologies is not common. Since the technological innovation that is considered here is very much in its nascent stages there may not as yet be a large body of users in a B2B context. Therefore, this provides a rich opportunity to conduct academic research. We expect this chapter to sow the seeds for extensive empirical research in the future.

Chapter XLVI

Extending Enterprise Architecture with Mobility 487

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This chapter describes the extension of EA with mobility so as to facilitate easier implementation of applications that overcome the boundaries of time and location. This extension of EA with mobility results in a comprehensive Mobility Enterprise Architecture (M-EA) that provides the business with advantages of real-time business processes, reduced costs, increased client satisfaction, and better control. This chapter outlines the M-EA framework, which is based on the literature review, initial modeling and a case study carried out by the lead authors. Later, the framework is validated by another case study carried out at international software development organization. Further validation of the model is envisaged through action research in multinational organizations.

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Mobile Web Services (MWS) technologies, generally built around the ubiquitous Extensible Markup Language (XML), has provided many opportunities for integrating enterprise applications. Currently, the WS paradigm is driven through parameters however; the paradigm shift that can result in true collaborative business requires us to consider the business paradigm in terms of policies-processes-standards. This chapter based on experimental research carried out by the authors, demonstrates how the technologies of WS open up the doors to collaborative Enterprise Architecture Integration (EAI) and Service Oriented Architecture (SOA) resulting in developing mobile applications.

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Wenbing Zhao, Cleveland State University, USA

Wireless Web services need to handle the additional challenges of limited computing power, limited network bandwidth, limited battery life, and unpredictable online time, that come with mobility. This chapter discusses the challenges and solutions of wireless Web services. The issues worked on are: optimization of the wireless Web

services messaging protocol, caching, and fault tolerance. This chapter also points out the limitations of the current approaches and outlines the future research directions on wireless Web services.

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Investigation into the Impact of Integration of Mobile Technology Applications into Enterprise

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Ming-Chien (Mindy) Wu, University of Western Sydney, Australia

The Mobile Enterprise Architecture (M-EA) model provides the organization with advantages of real-time business processing, better customer, and end-user services, and the addition of increased control across the entire organisation. The MEA function focuses on the collection and analysis of information including software applications, business processes, business information (data), technology, and governance (people). The chapter presents an overview of EA and M-EA models and also includes investigations of the advantages; limitations and blueprint overcome those challenges of M-EA implementation.

Chapter L

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Ekata Mehul, Gujarat University, India

Vikram Limaye, India

Accessibility of “Wireless Ad Hoc Network” (WAHN) is an advantage as well as a challenge, particularly from a security viewpoint. Wireless security solutions include encryption, secure routing, quality of service, and so forth. However, each of these solutions is designed to operate in a particular situation; and it may fail to work successfully in other scenarios. This chapter offers an alternate to improving the trustworthiness of the neighbourhood and securing the routing procedure. This security is achieved by dynamically computing the trust in neighbours and selecting the most secure route from the available ones for the data transfer. There is also a provision to detect the compromised node and virtually removing it from the network.

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Patient care has undergone dramatic improvement due to mobility. However, the volume of patient monitoring data mandates the use of Decision Support Systems (DSS) that provide clinical diagnoses and treatment methodology consistent with the urgency. This chapter describes clinical DSS that helps healthcare professionals, reduces workload, and providing better care for patients.

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Case Studies in Mobile Business 568

Marco Garito, Digital Business, Italy

This chapter describes mobile business applications and initiatives in companies who successfully implemented their go-to-market strategy in the wireless world. This chapter starts by describing the current market situation for mobile environment. This is followed by discussion on the Lateral Marketing approach and then some examples of mobile applications and services related to the approach.

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<i>Marco Garito, Digital Business, Italy</i>	

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<i>N. Raghavendra Rao, SSN School of Management & Computer Applications, India</i>	

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<i>Kamlesh Chaudhary, University of Technology, Sydney, Australia</i>	

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Bhuvan Unhelkar, MethodScience.com & University of Western Sydney, Australia

This chapter explains the results of an action research carried out at ImpexDocs in Sydney, Australia. The purpose of this action research is to investigate the business processes of the Export Companies that collaborate with the organizations involved in customs in Australia. The chapter provides an insight into applications of Collaborative Business Process Engineering (CBPE) in terms of improving the effectiveness and efficiency for all organizations involved in custom (especially export). The study demonstrates an understanding of the depth analyses of existing business processes under development investigates the collaboration between the export companies system with other enterprises involved, investigates the existing channels of collaboration and the common business processes threads that run thru multiple applications.

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