

Preface

One of the hottest topics in the information technology world today is mobile computing and mobile commerce (m-commerce). The rate at which technology impacts our professional and personal lives, businesses, and society is remarkable. The information revolution has transformed global economies and how companies do business.

The client/server paradigm moved the computing industry into new areas, both from a technical and business standpoint. As the Internet paradigm continues to evolve, one important area that is growing is the wireless and mobile areas. The pace at which the computing and communication industries are converging is very rapid. Wireless phones and personal digital assistants (PDAs) are quickly evolving into powerful multipurpose devices. With the continued evolution of m-commerce and electronic commerce (e-commerce) companies are doing more and more business electronically and in mobile environments.

This book discusses many of the issues involved in developing mobile and electronic architectures, deciding on what mobile devices and mobile operating systems should be implemented on those architectures, mobile security is addressed, various frameworks and business models are discussed, as well as factors that influence decisions that are made regarding the technology. The book introduces a number of important topics that need to be understood before making any large investments in this technology area.

The book is organized into 19 chapters. A description of each of the chapters follows:

Chapter 1 entitled, “A Concept for the Evaluation of E-Commerce-Ability” by Ulrike Baumöl, Thomas Stiffel and Robert Winter develops a concept to evaluate the e-commerce-ability of a corporation and applies the framework to basic roles of the e-commerce environment. The concept comprises two components: A four dimensional framework is proposed which can be used to represent the degree of external coordination, the degree of alignment of business towards organizational and cultural rules of the networked economy, the degree of orientation towards customer needs and the degree of systematic and integral use of information and communication technology (ICT). Based on this framework, an evaluation approach is presented which supports a maturity analysis.

Chapter 2 entitled, “M-Commerce: A Location-Based Value Proposition” by Nenad Jukic, Abhishek Sharma, Boris Jukic and Manoj Parameswaran defines Mobile Commerce (m-commerce) as a process of conducting commercial transactions

via a “mobile” telecommunications networks using communication, information, and payment devices such as a mobile phone or a palmtop unit. They analyze the potential ramifications to the field of marketing and changes in the market due to the advent of m-commerce. In particular, they analyze the opportunities that various characteristics of the m-commerce model can bring to the field of marketing. They investigate the likelihood of emergence of mall-like zones that are based both on the geographical proximity of services and goods providers and the use of mobile communication devices. Such zones have a potential of becoming the basic units for any analysis of m-commerce scenarios. As m-commerce attains maturity, the zones could become the fundamental parameter in marketing evaluation.

Chapter 3 entitled, “E-Commerce Adoption in Small Firms: A Study of Online Share Trading” by Pak Y. P. Chan and Annette M. Mills examines adoption of an electronic commerce technology (namely, order-execution online trading technology) by six small brokerage firms at various stages in the evaluation and adoption process. The study is informed by innovation theory and prior research, and seeks to identify the key factors influencing the adoption process. Consistent with innovation theory, the case findings suggest that three classes of factors influence adoption: innovation factors, innovation factors, organisational factors, and environmental factors. The key factors within each of these classes were identified as compatibility and perceived benefits (innovation factors), IT sophistication, internal and external IT support, and management support (organisational factors); and pressure from e-commerce-able competitors and clients (environmental factors). Of these variables, compatibility and perceived benefits were found to be the most significant, impacting e-commerce adoption.

Chapter 4 entitled, “Conceptualizing the SMEs’ Assimilation of Internet-Based Technologies” by Pratyush Bharati and Abhijit Chaudhury conceptualizes a model for the assimilation of internet-based technologies in small and medium enterprises (SMEs). The research examines the factors influencing the assimilation of Internet based technologies and the penetration of these technologies in SMEs. Internet based technologies are complex organizational technologies. The model uses the learning related scale, related knowledge, and diversity together with several control variables like host size, IT size, specialization, education. Several external factors, such as influence of customers, suppliers, vendors and competitors that have been suggested in studies of SMEs have also been included to explain the assimilation and diffusion of innovation. The results of an exploratory survey are presented and future research is discussed.

Chapter 5 entitled, “Strategic Issues in Implementing Electronic-ID Services: Prescriptions for Managers” by Bishwajit Choudhary examines e-security solutions (e.g., digital certificates, e-signatures, e-IDs) that have gained tremendous attention as they promised to plug the security loopholes and create trusted electronic markets. Implementation of such critical, complex and costly security solutions demands their thorough assessment at technical as well as business levels. Based on the author’s experience at one of Scandinavia’s leading vendors of banking solutions

and infrastructure, the chapter develops basic concepts, discusses strategic (product, market and technical) concerns and finally summarizes the contemporary challenges facing the implementation of e-ID schemes.

Chapter 6 entitled, “Potential Roles for Business-to-Business Marketplace Providers in Service-Oriented Architectures” by Markus Lenz and Markus Greunz introduces the concept of a service oriented architecture and assesses its applicability to business-to-business (B2B) marketplaces. In order to provide substantial value to their members marketplaces have to offer a comprehensive service offering that aims to support all phases of the transaction process. Building up such a service offering is not a one-time effort, but electronic B2B marketplaces will have to continuously evolve their service offerings and to adapt it to ever-changing needs of the companies they serve. Therefore, instead of trying to create such an extensive service offering on their own, we argue that B2B marketplaces have to make use of partnerships with specialized service providers. Only by partnering they can make use of speed and scale of such a collaboration of specialists (Ernst et al., 2001). This view of B2B marketplaces as integrators of services from multiple parties puts some new demands on architectural issues of the marketplaces. A service-oriented architecture may help to cope with these new demands. To test this view a survey among European B2B marketplaces has been carried out in order to match their service development and their needs with the characteristics of a service-oriented architecture and the potential roles that marketplace providers can play in such a concept.

Chapter 7 entitled, “An Evaluation of Dynamic Electronic Catalog Models in Relational Database Systems” by Kiryoong Kim, Dongkyu Kim, Jeuk Kim, Sang-uk Park, Ighoon Lee, Sang-goo Lee and Jong-hoon Chun discusses electronic catalogs that are electronic representations of required to manage diverse and flexible schemas of products in electronic commerce. Although relational database systems seem an obvious way for their storage, traditional designs of relational schemas do not support electronic catalogs. Therefore, new models for managing diverse and flexible schemas in relational databases are required for such systems. In this chapter, several models for electronic catalogs using relational tables, and an experimental evaluation of their efficiency. Some of the proposed models were more efficient than currently used ones, and they can be put to practical use.

Chapter 8 entitled, “Extending Client-Server Infrastructure Using Middleware Components” by Qiyang Chen and John Wang research the embracing of inapt infrastructure technology which is a major threat in developing extensive and efficient Web-based systems. The architectural strength of all business models demands an effective integration of various technological components. Middleware, the center of all applications, becomes the driver—everything works if middleware does. In the recent times, the client/server environment has experienced sweeping transformation and led to the notion of the “Object Web.” Web browser is viewed as a universal client that is capable of shifting flawlessly and effortlessly between various applications over the Net. This paper attempts to investigate middleware

and the facilitating technologies and point toward the latest developments, taking into account the functional potential of the on-market middleware solutions as well as their technical strengths and weaknesses. The chapter describes various types of middleware including database middleware, Remote Procedure Call (RPC), application server middleware, message-oriented middleware (MOM), Object Request Broker (ORB), transaction-processing monitors, and Web middleware, etc., with on-market technologies.

Chapter 9 entitled, “E-Business Experiences with Online Auctions” by Bernhard Rumpe discusses how online auctions are among the most influential e-business applications. Their impact on trading for businesses as well as consumers is both remarkable and inevitable. There have been considerable efforts in setting up market places, but with respects to market volume online trading still lays in its early stages. This chapter discusses the benefits of the concept of Internet marketplaces, with the highest impact on pricing strategies, namely, the conduction of business online auctions. It discusses their benefits, the problems occurring, and possible solutions. In addition, sketch actions for suppliers to achieve a better strategic position in the upcoming Internet market places.

Chapter 10 entitled, “Implementing Privacy Dimensions within an Electronic Storefront” by Chang Liu, Jack Marchewka and Brian Mackie research how electronic businesses will attempt to distinguish themselves from their competition and gain competitive advantage by customizing their Web sites in order to build a strong relationship with their customers. This will require the collection and use of personal information and data concerning the customer’s online activities. Although new technologies provide an opportunity for enhanced collection, storage, use, and analysis of this data, concerns about privacy may create a barrier for many electronic businesses. For example, studies suggest that many people have yet to shop online or provide personal information due to a lack of trust. Moreover, many others tend to fabricate personal information. To this end, many electronic businesses have attempted to ease customers’ concerns about privacy by posting privacy policies or statements or by complying with a particular seal program. Recently, the Federal Trade Commission has proposed four privacy dimensions that promote fair information practices. These dimensions include: (1) notice/awareness, (2) access/participation, (3) choice/consent, and (4) security/integrity. An electronic storefront was developed to include these privacy dimensions as part of study to learn how privacy influences trust and, in turn, how trust influences behavioral intentions to purchase online. The empirical evidence from this study strongly suggests that electronic businesses can benefit by including these privacy dimensions in their Web sites. This chapter will focus on how these dimensions can be implemented within an electronic storefront.

Chapter 11 entitled, “An E-Channel Development Framework for Hybrid E-Retailers” by In Lee researches the profound impact of e-commerce on organizations, e-channel development emerged as one of the most important challenges that managers face. Unfortunately, studies indicate that managers in most large compa-

nies are still unclear about an e-commerce strategy, and tend to lack adequate e-commerce development expertise. Poorly planned and developed e-commerce channels add little value to organizations. Furthermore, these poorly developed e-channels may even have negative impact on their organizations by confusing and disappointing customers who value a seamless cross-channel experience. To develop an e-channel that delivers higher utility to customers and generates sustainable long-term profits, managers need to analyze how an e-commerce channel affects the performance of existing channels and develop a company-wide e-channel development program. Based on a number of e-commerce case studies, we developed an e-channel development framework which consists of five step-by-step phases: (1) strategic analysis, (2) e-channel planning, (3) e-channel system design, (4) e-channel system development, and (5) performance evaluation and refinement. This framework helps managers evaluate the impact of e-commerce channels on organizational performance and determine the most appropriate channel design and integration mechanisms for the achievement of business strategies. This chapter also discusses impact of e-channel structures on organizational performance.

Chapter 12 entitled, “Organization, Strategy and Business Value of Electronic Commerce: The Importance of Complementarities” by Ada Scupola describes how many corporations are reluctant to adopt electronic commerce due to uncertainty in its profitability and business value. This chapter introduces a business value complementarity model of electronic commerce. The model relates high level performance measures such as business value first to intermediate performance measures such as value chain and company strategy and then to the e-business performance drivers as business processes and complementary technologies. The model argues that complementarities between the different activities of the value chain, corresponding business processes and supporting technologies should be explored to reach a better fit between strategy, business model and technology investments when entering the electronic commerce field. The exploration of such complementarities should lead to investments in electronic commerce systems that best support the company strategy, thus minimizing failures. From a practical point of view, managers could use this framework as a methodology to increase the business value of electronic commerce to a corporation.

Chapter 13 entitled, “Continuous Demand Chain Management: A Downstream Business Model for E-Commerce” by Merrill Warkentin and Akhilesh Bajaj discusses the demand side of supply chain management which has drawn considerable research attention, with focus on disintermediation and syndication models. In this chapter, we evaluate new business models for establishing a continuous demand chain structure to streamline the logistics between the vendor and its direct consumers. The Continuous Demand Chain Management (CDCM) model of E-Commerce is one in which the physical products for sale are delivered directly to the customer without the use of a third party logistics provider, such as a common carrier, and in which the physical product may be continuously “pulled” from the seller. We present three submodels of CDCM: The CDCM Model A applies to business-to-consumer

(B2C) online sellers of physical goods who own or control their own delivery vehicles and may provide further services to extend the value proposition for the buyer. The online grocer is a typical example of businesses in this category. The CDCM Model B applies to business-to-business (B2B) sellers of physical goods, who also own a significant portion of their delivery fleet and deliver goods on demand to local distributors or business customers. Office supply E-Merchants provide an example of this model. The CDCM Model C applies to businesses that typically provide virtually instantaneous delivery of third party goods to consumers or businesses. Businesses in this category own or control their own delivery fleet and add value by delivering items within very short periods of time, usually one-hour delivery.

In order to analyze these models we conducted structured interviews with key senior managers of one representative business each in the CDCM Model A and Model B categories. We extensively surveyed recent literature on companies in the CDCM Model C category. We use the results of our study to analyze different aspects such as revenue streams, cost structure, and operational peculiarities of businesses following the CDCM model, and finally discuss the long-term viability of the sub models.

Chapter 14 entitled, “Web-Based Supply Chain Integration Model” by Latif Al-Hakim discusses various business process supply-chain models and emphasises the need for organisations to apply CRM concepts and to integrate the Internet within the functions of the supply chain in order to be able to gain good customer expectations in the era of e-commerce. This chapter outlines a framework for developing a web-based supply chain integrating model based on SCOR and key features of CPFR and attempts to link this model with Business Process Reengineering and with traditional productivity improvement programs. The development of a website at two levels is suggested. The first level is within the public domain and the other is limited to supply chain partners. The chapter incorporates fuzzy set theory into the dynamic of production scheduling to allow the integrating model to deal with vague constraints and to enable conflicting multi-criteria objectives to be managed effectively in the production environment.

Chapter 15 entitled, “A Cooperative Communicative Intelligent Agent Model for E-Commerce” by Ric Jentzsch and Renzo Gobbin researches the complexities of business continues to expand. First technology, then the World Wide Web, ubiquitous commerce, mobile commerce, and who knows. Business information systems need to be able to adjust to these increased complexity while not creating more problems. Here we put forth a conceptual model for cooperative communicative intelligent agents that can extent itself to the logical constructs needed by modern business operations today and tomorrow.

Chapter 16 entitled, “Supporting Mobility and Negotiation in Agent-Based E-Commerce” by Ryszard Kowalczyk and Leila Alem presents recent advances in agent-based e-commerce addressing the issues of mobility and negotiation. It reports on selected research efforts focusing on developing intelligent agents for automating the e-commerce negotiation and coalition formation processes, and mobile

agents for supporting deployment of intelligent e-commerce agents and enabling mobile e-commerce applications. Issues such as trade-off between decision-making in negotiation and mobility capabilities of the agents are also discussed in this chapter.

Chapter 17 entitled, “Deploying Java Mobile Agents in a Project Management Environment” by F. Xue and K. Y. R. Li introduces mobile agent technology and explains how it can help businesses to implement client-server enterprise computing solutions. A Java mobile agent-based project management system prototype is presented to demonstrate the main features of mobile agents (mobility, functionality, intelligence and autonomous), and how they help to enhance communication processes and facilitate security within the project environment. It suggests a practical way to isolate all host resources from all visiting agents using host agents and exported host functions. It also proposes a communication infrastructure to support intelligent dialogue between agents.

Chapter 18 entitled, “Factors Influencing Users’ Adoption of Mobile Computing” by Wenli Zhu, Fiona Fui-Hoon Nah and Fan Zhao introduces a model that identifies factors influencing users’ adoption of mobile computing. It extends the Technology Acceptance Model (TAM) by identifying system and user characteristics that affect the perceived usefulness and perceived ease of use of mobile computing, which are two key antecedents in TAM. Furthermore, it incorporates two additional constructs, trust and enjoyment, as determinants in the model, and proposes specific factors that influence these two constructs. The long-term goals of this work are to gain an increased understanding of adoption issues in mobile computing, and to explain how specific HCI design issues may affect adoption by users.

Chapter 19 entitled, “Mobile Computing Business Factors and Operating Systems” by Julie R. Mariga introduces the enormous impact mobile computing is having on both companies and individuals. Companies face many issues related to mobile computing. For example, which devices will be supported by the organization, which devices will fulfill the business objectives, which form factor will win, which features and networks will future devices offer, which operating systems will they run, what will all this cost, what are the security issues involved, what are the business drivers? This chapter will discuss the major business drivers in the mobile computing field and provide an analysis of the top two operating systems that are currently running the majority of mobile devices. These platforms are the 1) Palm operating system (OS) and 2) Microsoft Windows CE operating system. The chapter will analyze the strengths and weaknesses of each operating system, discuss market share and, future growth.