

Preface

In many ways, motion and computing are the two advances that define our modern age. The ability to move previously unimaginable distances and electronically perform complex tasks, both in breathtakingly short amounts of time, has revolutionized and opened up the entire globe. Mobile computing sits in the vibrant junction of these two defining advances. As this modern world demands more mobility and a greater range of computing options, a keen understanding of the issues, theories, strategies and emerging trends associated with this rapidly developing field is becoming more and more important to researchers, professionals and all users alike.

In recent years, the applications and technologies generated through the study of mobile computing have grown in both number and popularity. As a result, researchers, practitioners, and educators have devised a variety of techniques and methodologies to develop, deliver, and, at the same time, evaluate the effectiveness of their use. The explosion of methodologies in the field has created an abundance of new, state-of-the-art literature related to all aspects of this expanding discipline. This body of work allows researchers to learn about the fundamental theories, latest discoveries, and forthcoming trends in the field of medical informatics.

Constant technological and theoretical innovation challenges researchers to remain informed of and continue to develop and deliver methodologies and techniques utilizing the discipline's latest advancements. In order to provide the most comprehensive, in-depth, and current coverage of all related topics and their applications, as well as to offer a single reference source on all conceptual, methodological, technical, and managerial issues in medical informatics, Information Science Reference is pleased to offer a six-volume reference collection on this rapidly growing discipline. This collection aims to empower researchers, practitioners, and students by facilitating their comprehensive understanding of the most critical areas within this field of study.

This collection, entitled **Mobile Computing: Concepts, Methodologies, Tools, and Applications**, is organized into eight distinct sections which are as follows: (1) Fundamental Concepts and Theories, (2) Development and Design Methodologies, (3) Tools and Technologies, (4) Utilization and Application, (5) Organizational and Social Implications, (6) Managerial Impact, (7) Critical Issues, and (8) Emerging Trends. The following paragraphs provide a summary of what is covered in each section of this multi-volume reference collection.

Section One, **Fundamental Concepts and Theories**, serves as a foundation for this exhaustive reference tool by addressing crucial theories essential to understanding mobile computing. Some basic topics impacted by this field are examined in this section through articles such as "A Mobile Computing and Commerce Framework" by Stephanie Teufel, Patrick S. Merten and Martin Steinert. This selection introduces a key topic further developed and discussed through later selections, the intersection of mobile computing and its commercial implications. The selection "Environments for Mobile Learning" by Han-Chieh Chao, Tin-Yu Wu, and Michelle T.C. Kao provides a sampling of how mobility impacts

educational trendsetting. Another important basic topic in this section is ushered in by M. Halid Kuscu, Ibrahim Kushchu, and Betty Yu and their contribution entitled “Introducing Mobile Government,” which introduces the concept of mobile government and creates a context for discussing various applications, services, and the relevant technologies. “A Taxonomy of Database Operations on Mobile Devices” by Say Ying Lim, David Taniar and Bala Srinivasan informs the vital area of databases while grounding the reader in its possible operations, and “Mobile Portals” by Ofir Turel and Alexander Serenko offers a explanation and exploration of the ability of mobile portals to diffuse and penetrate even remote populations. These are only some of the elemental topics provided by the selections within this comprehensive, foundational section that allow readers to learn from expert research on the elemental theories underscoring mobile computing.

Section Two, **Development and Design Methodologies**, contains in-depth coverage of conceptual architectures and frameworks, providing the reader with a comprehensive understanding of emerging theoretical and conceptual developments within the development and utilization of mobile computing. In opening this section, “Developing Smart Client Mobile Applications” by Jason Gan exemplifies the issues addressed in this section by examining the usability and accessibility of mobile applications and services and suggesting development. The development of mobile applications is also discussed in “Location Area Design Algorithms for Minimizing Signalling Costs in Mobile Networks” by J. Gutierrez, Vilmos Simon and Sándor Imre. Also included in this section is the selection “It’s the Mobility, Stupid’: Designing Mobile Government” by Klas Roggenkamp, which lays out the challenges and possibilities of designing for mobile government. Overall, these selections outline design and development concerns and procedures, advancing research in this vital field.

Section Three, **Tools and Technologies**, presents extensive coverage of various tools and technologies and their use in creating and expanding the reaches of mobile computing. The multitude of mobile business applications, their uses and their individual efficiency is explored in such articles as “Evaluation of Mobile Technologies in the Context of Their Applications, Limitations, and Transformation” by Abbass Ghanbary, “Knowledge Representation in Semantic Mobile Applications” by Pankaj Kamthan, and “Mobile Portal Technologies and Business Models” by David Parsons. With a look toward the near future, the selection “A Virtual Community for Mobile Agents” by Sheng-Uei Guan and Fangming Zhu features in-depth discussions of the probable uses and benefits of mobile agents in a variety of fields. The ever-developing culture of mobile multimedia is represented in this section as well, with “Discovering Multimedia Services and Contents in Mobile Environments” by Zhou Wang and Hend Koubaa, “V-Card: Mobile Multimedia for Mobile Marketing” by Holger Nösekabel and Wolfgang Röckelein, and “The Design of Mobile Television in Europe” by Pieter Ballon and Olivier Braet. The rigorously researched chapters contained in this section offer readers countless examples of modern tools and technologies that emerge from or can be applied to mobile computing.

Section Four, **Utilization and Application**, investigates the use and implementation of mobile technologies and informatics in a variety of contexts. One prominent context is mobile phone use, thoroughly analyzed in throughout the world in the articles “Exploring the Use of Mobile Data Services in Europe: The Cases of Denmark and Greece” by Ioanna D. Constantiou and Maria Bina, “The Mobile Phone Telecommunications Service Sector in China” by Michelle W. L. Fong, “United States of America: Renewed Race for Mobile Services” by Mats Samuelsson, Nikhilesh Dholakia and Sanjeev Sardana, and “M-Learning with Mobile Phones” by Simon So. This latter topic, m-learning, is continued by Hans Lehmann, Stefan Berger and Ulrich Remus in “A Mobile Portal for Academe,” while Anna Trifonova reaches the root of two vital issues in “Accessing Learning Content in a Mobile System: Does Mobile Mean Always Connected?” Questioning applications and technology is rarely more important than in the health sector, the focus of a number of articles beginning with “Perception of Mobile Technology Provi-

sion in Health Service” by Astrid M. Oddershede and Rolando A. Carrasco and ending with “Integrating Mobile-Based Systems with Healthcare Databases” by Yu Jiao, Ali R. Hurson, Thomas E. Potok and Barbara G. Beckerman. This section ends with articles pertaining to commerce, business and government, providing a complete understanding of the successes and limitations of mobile computing.

Section Five, **Organizational and Social Implications**, includes a wide range of research pertaining to the organizational and cultural implications of mobile computing. The section begins with “Mobile Virtual Communities” by Glauber Ferreira, Hyggo Almeida, Angelo Perkusich, and Evandro Costa, a selection explores virtual communities, describing the main issues that have culminated in the creation of this research area, also the topic of “Mobile Virtual Communities of Commuters” by Jalal Kawash, Christo El Morr, Hamza Taha, and Wissam Charaf, “Wireless Local Communities in Mobile Commerce” by Jun Sun, and “From Communities to Mobile Communities of Values” by Patricia McManus and Craig Standing. Akin the idea of community is the topic of trust, the subject of “Consumer Perceptions and Attitudes Towards Mobile Marketing” by Amy Carroll, Stuart J. Barnes and Eusebio Scornavacca. Lastly, “Mobile Networked Text Communication: The Case of SMS and Its Influence on Social Interaction” by Louise Barkhuus provides insight into how certain functions of mobile technology affect social interaction – an important consideration to end this section detailing how mobile computing shapes and is shaped by human culture and logic.

Section Six, **Managerial Impact**, presents contemporary coverage of the managerial applications and implications of mobile computing. Core concepts covered include the impact of mobile computing on business practices, customer and business interaction, and business communication, policies and strategies. “Comprehensive Impact of Mobile Technology on Business” by Khimji Vaghjiani and Jenny Teoh begins the section with an insightful introduction. Also included are the articles “Consumers’ Preferences and Attitudes Toward Mobile Office Use: A Technology Trade-Off Research Agenda” by Xin Luo and Merrill Warkentin, “Customer Relationship Management on Internet and Mobile Channels: An Analytical Framework and Research Directions” by Susy S. Chan and Jean Lam, and “Exploring Mobile Service Business Opportunities from a Customer-Centric Perspective” by Minna Pura and Kristina Heinonen, which expound on the concerns surrounding customer relationships with mobile technologies. This section concludes with a insights on topics including telecommunications, the media and gaming industries, knowledge management and mobile enterprising—a few of the subjects necessary to understand managing and mobile computing.

Section Seven, **Critical Issues**, presents readers with an in-depth analysis of the more theoretical and conceptual issues within this growing field of study by addressing topics such as the quality and security of mobile computing. “Mobile Code and Security Issues” by E. S. Samundeeswari and F. Mary Magdalene Jane, “Security of Mobile Code” by Zbigniew Kotulski, and “Security in Mobile Agent Systems” by Chua Fang Fang and G. Radhamani, address necessary security considerations. The article “Privacy and Anonymity in Mobile Ad Hoc Networks” by Christer Andersson, Leonardo A. Martucci and Simone Fischer-Hübner raises similar concerns. The quality of mobile computing services is pondered in articles such as “Quality of Service in Mobile Ad Hoc Networks” by Winston K. G. Seah and Hwee-Xian Tan, “Quality of Service Issues in Mobile Multimedia Transmission” by Nalin Sharda, and “A Study on the Performance of IPv6-Based Mobility Protocols: Mobile IPv6 vs. Hierarchical Mobile IPv6” by Ki-Sik Kong, Sung-Ju Roh and Chong-Sun Hwang. Further discussion of critical issues includes obstacles surrounding ad hoc networking, database querying and management, data dissemination, broadcasting and processing. In all, the theoretical and abstract issues presented and analyzed within this collection form the backbone of revolutionary research in and evaluation of mobile computing.

The concluding section of this authoritative reference tool, **Emerging Trends**, highlights research potential within the field of mobile computing while exploring uncharted areas of study for the advance-

ment of the discipline. The development and deployment of new forms of mobile computing is explored in selections entitled “Bridging Together Mobile and Service-Oriented Computing” by Loreno Oliveira, Emerson Loureiro, Hyggo Almeida and Angelo Perkusich, “Context-Awareness and Mobile Devices” by Anind K. Dey and Jonna Häkkinä, “Component Agent Systems: Building a Mobile Agent Architecture That You Can Reuse” by Paulo Marques and Luís Silva, and “Voice Driven Emotion Recognizer Mobile Phone: Proposal and Evaluations” by Aishah Abdul Razak, Mohamad Izani Zainal Abidin, and Ryoichi Komiya. Other new trends, such as developments concerning RFID, time-critical decisions, collaboration between mobile devices and new concepts supporting user collaboration are included in and stretch our concept of what mobile computing can be. This final section demonstrates that mobile computing, with its propensity for constant change and evolution, will continue to both shape and define the modern face of business, health, culture and human interaction.

Although the contents of this multi-volume book are organized within the preceding eight sections which offer a progression of coverage of important concepts, methodologies, technologies, applications, social issues, and emerging trends, the reader can also identify specific contents by utilizing the extensive indexing system listed at the end of each volume. Furthermore, to ensure that the scholar, researcher, and educator have access to the entire contents of this multi-volume set, as well as additional coverage that could not be included in the print version of this publication, the publisher will provide unlimited, multi-user electronic access to the online aggregated database of this collection for the life of the edition free of charge when a library purchases a print copy. In addition to providing content not included within the print version, this aggregated database is also continually updated to ensure that the most current research is available to those interested in mobile computing.

As mobile computing continues to expand, both in variety and usefulness, this exciting and revolutionary field will prove even more necessary to everyday life. Intrinsic to our ever-modernizing, ever-expanding, global economy is mobility and technology, the two aspects that define the contents of these articles. Continued progress and innovation, driven by a mobile, demanding consumer base, will only further establish how necessary and vital a sure understanding of mobile computing and the changes and challenges influencing today’s modern, dynamic world.

The diverse and comprehensive coverage of mobile computing in this six-volume, authoritative publication will contribute to a better understanding of all topics, research, and discoveries in this developing, significant field of study. Furthermore, the contributions included in this multi-volume collection series will be instrumental in the expansion of the body of knowledge in this enormous field, resulting in a greater understanding of the fundamentals while also fueling the research initiatives in emerging fields. We at Information Science Reference, along with the editor of this collection, hope that this multi-volume collection will become instrumental in the expansion of the discipline and will promote the continued growth of mobile computing.