Preface

The impacts of mobile technologies are tremendous. These technologies will continue to bring changes in the way people communicate and interact with others in the years to come. They have given rise to increasing expectations to be responsive among individuals, and developers in communities, businesses and societies. While mobile technologies have brought a multitude of benefits to users regardless of age, they are also recognized to pose threats to users. Notably, issues surrounding mobile computing and technologies will continue to prevail.

This book lends insights into social, behavioral and technical aspects surrounding mobile computing. It discusses recent research findings on mobile technologies from social, behavioral and technical perspectives of users, developers, designers and groups with special needs. Each chapter of the book acknowledges specific challenges of individuals in certain communities, mobile application business, environmental conditions, threats in the digital world and/or distinctive societies that are expected to adhere to religious practices in the course of using mobile technologies. These challenges and gaps identified serve as motivations for research.

The book aims at aiding future research and providing recommendations and guidelines for practice in mobile computing, mobile technology use, mobile application development and mobile technology security. Critical Socio-Technical Issues Surrounding Mobile Computing is organized into fourteen chapters.

Chapter 1 and 2 provide a focus on groups with special needs for specific mobile application. Notably in Chapter 1 "A Survey on Islamic Mobile Applications for Children", Fitria Maulida Machfud and Murni Mahmud provide insights into Islamic mobile applications for Muslim children. Surveying the different mobile platform application stores, they noted issues surrounding mobile applications for Muslim children. Building on the issues, the chapter offers considerations for designing mobile applications for Muslim children that conform to the Islamic principles (*Sharia*) and cultural background. While Chapter 1 focuses on Muslim children, Chapter 2 "A Usable Islamic Mobile Calendar for Elderly Users" by Fariza Hanis Abdul Razak and Nur Farhana Abdullah highlights on Muslim elderly users. The chapter discusses usable design of an Islamic mobile calendar for Muslim elderly users. Adopting a user study with selected elderly participants and two existing Islamic calendars as probes, the researchers defined Muslim elderly user's requirement for enhanced design of Islamic calendars.

The business of mobile applications presents opportunities for researchers and mobile technology retailers to rethink about capturing the market. Chapter 3 "Social and Technical Perspective of Individual's Intention to Purchase Mobile Application" by Ili Hawa Ahmad, Norshidah Mohamed and Ab Razak Che Hussain discusses insights into individuals' purchase intention of mobile applications. Using exploratory research approach, they identified factors that link to individual's purchase intention.

The use of mobile technologies in learning has given rise to the notion of collaborative mobile learning. Chapter 4 "Collaborative Mobile Learning: A Systematic Literature Review" by Nor Fadzleen Sa'don and Noorminshah Iahad presents a synthesis of systematic review of prior researches on patterns, trends and methodologies for collaborative mobile learning.

As mobile technologies become pervasive, its effects permeate the society at large. The subsequent chapters share researchers' insights into the application of mobile technologies to specific communities.

Challenges abound for designers and developers of wayfinding systems that particularly target multilingual and multicultural users. Chapter 5 "Design of a Hospital Interactive Wayfinding System: Designing for Malaysian Users" by Ashok Sivaji, Hizbullah Kampo Radjo, Mohd-Faizal Amin and Mohd Azrin Hafizie Abu Hashim shares user's challenges in way-finding at hospitals in a multilingual and multicultural society. The chapter advances into a discussion of design, development and test of a hospital interactive wayfinding system (HIWS) in overcoming the recognized challenges. The chapter concludes with potential enhancements of the HIWS besides immediate and prospective long term benefits of the system.

While Chapter 5 delves into wayfinding, Chapter 6 "Developing a Mobile Navigation Aid" by Mohamad Shahirul Azrix Mohamed, Noor Afiq Walid, Akram M. Zeki presents the development of a navigation aid for an academic community. A unique feature of the application is the integration of navigation aid with user's tasks and daily prayer reminders.

A practical tool for usability assessment in a mobile work context is the focus of Chapter 7 "System Usability Scale Implementation for Interfaces on Mobile Touch Screen Devices Assessment" contributed by Svetlana Cicevic, Slobodan Mitrović, Milkica Nešić and Andreja Samčović. Through the application of System Usability Scale (SUS), the chapter shows how it is applied to test Tablet PC usability. The chapter concludes with a proposed framework for usability testing to aid practitioners and researchers in improving usability of interfaces on touch screen mobile devices.

Chapter 8 "Linguistic Location Authority: An Intricate Imperative" by Akeem Olowolayemo, Abu Osman Md Tap and Teddy Mantoro offers an excellent discussion on the requirements and prospects of presenting location authority in linguistic form. At the onset, the chapter reviews traditional approaches that include geometric and its extension in the form of topological or symbolic location authority. It concludes with an identification of prospects and challenges in the implementation of location based devices.

Chapter 9 "Managing Students' Attendance Using NFC Enabled Mobile Phones" is another chapter that devotes to academic community. Contributed by Media Anugerah Ayu, Barroon Ismaeel Ahmad and Teddy Mantoro, the chapter presents a unique yet cost-effective proposal of student attendance management. In this chapter, the researchers suggest the application of Near Field Communication (NFC) technology that integrates with mobile device. The combined application of NFC and mobile device provides a distinctive feature that does not require further hardware installation; thus bringing the investment of hardware for implementation at a minimum.

Chapter 10 "Mobile Water Meter System in Android Environment" by Wiwin Windihastuty, Teddy Mantoro and Media Anugerah Ayu shares an insight that is motivated by a need to solve a problem in Indonesia's water meter recording. The researchers propose a framework that is characterized by capturing images of water consumption using a smart phone. These images are consequently converted for further processing by the Regional Water Company (PAM).

Mobile security is a serious concern in mobile computing. Mobile devices are targets of attacks and such attacks could cause loss of information for business and individual users. Acknowledging this phenomenon, three chapters (Chapters 11, 12 and 13) are dedicated to a discussion on mobile security.

Responding to a rising trend of mobile malware, Olawale Surajudeen Adebayo and Normaziah Abdul Aziz in Chapter 11 "The Trend of Mobile Malwares and Effective Detection Techniques" review existing literature on android malware and provide an analysis on mobile detection approaches. Guidelines on mobile malware protection are offered at the end of the chapter.

In Chapter 12, "Issues Related to Network Security Attacks in Mobile Ad Hoc Networks (MANET) Security", Rakesh Kumar Singh identifies the existing security threats that an ad hoc network faces, security services required to be achieved and countermeasures for attacks in each layer. Rakesh uses a literature survey approach, makes a comparison to address threats in different layers and presents challenges and solutions.

Chapter 13 "Mobile Embedded System: Your Door Key Evolved with Your Smartphone: A User Evaluation of A Two-Factor Authentication" contributed by Pei-Lee Teh, Huo-Chong Ling, Soon-Nyean Cheong and Pervaiz K. Ahmed presents a design and development of smartphone access control system using Near Field Communication (NFC) Encrypted Steganography Graphical Password (ESGP). The system integrates token-based, graphical-password authentication, cryptography and steganography and, targets at leveraging the technical capability of NFC-enabled smartphones in developing a two-factor authentication system connecting physical resources and virtual resources. An evaluation of user's behavioral intention to use the system provides a fascinating social perspective that complements the technical discussion of design and development of an authentication system.

Chapter 14 "Unattended Sensors in Marine Environments" contributed by Rizal Mohd Nor and Mikhail Nesterenko concludes the book with an excellent discussion on the use of unattended sensors, their application in marine environment and insights into challenges of designing a marine sensor in harsh environments. Building on such groundwork, the chapter advances on a case study in implementing a marine sensor to study hypoxia and, development and test of a sensor buoy system. The chapter offers insights into the potential of the sensor buoy system based on its architectural design, technological components, investment viability and outcomes of experiments conducted.

This book shows the communication among the researchers through their recent research findings in the area of mobile computing. Recognizing the on-going social and technical challenges of mobile technology, the researchers present opportunities for further research that touch upon the social aspects of people and society and technical aspects of mobile computing.

This is a hope that readers including developers, designers, businesses and groups with special needs can use this book for their future research and as one of the resources in practicing mobile computing, mobile technology use, mobile application development and mobile technology security.

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