This book is about developing interactive information systems that support people at work or when conducting business. Specifically, it emphasizes the need to study and practice the development of HCI for real-world organizations in given contexts. Developing an effective information system means achieving a good fit among the users, their tasks, and the technology within organizational, social, and global contexts. In order to do this, designers need to have a good understanding of important factors that come into play. Designers need to understand why and how people interact with computers in order to accomplish their work and personal goals, what are the physical, cognitive, affective, and behavioral constraints on the users’ side, what pleases or annoys them, what makes human–computer interaction a satisfying experience or an experience that users do not want to repeat, and what makes the interaction efficient and effective. This knowledge is the foundation of human–computer interaction (HCI) development.

Furthermore, designers of HCI should know how to apply this foundational knowledge by using the tools and methods available for developing interactive information systems. They need to know how to set up the specific goals of effective HCI for a particular organizational information system, how to gather relevant and important data and information to form design decisions, how to evaluate their designs, and how to achieve HCI goals. This application knowledge can guide HCI development in a more structured and disciplined fashion rather than a piecemeal fashion.

In addition, designers need to know how to put the foundational knowledge and its application into contexts. Our position in this book is that one cannot separate people’s interaction with computers from the context in which they operate, just as one cannot fully understand what people communicate without knowing the context within which communication is carried out. The immediate context given in the book is organizational, managerial, and business work that dictates a concern with effectiveness of HCI design. Social and global contexts also play an important role in HCI development, especially with the growing global environment within which businesses operate.

The organizational and business context of HCI development is one of the distinctions of our book, compared to several other HCI textbooks. What are information systems in the organizational and business context? These systems support, for example, clerical work by office systems, managerial work by enterprise resource planning systems and project management software, group and individual decision tasks by decision support systems, commerce transactions by business transaction processing systems, information-seeking tasks by online libraries and other online information systems, customer commerce needs by electronic commerce systems, customer relationship by customer relationship management systems, organizational recruiting needs by online recruiting systems, and even business-to-business (B2B) needs by electronic data interchange (EDI) systems. Our concern is HCI development in
these systems. This scope excludes a direct treatment of other exciting areas such as HCI in the cockpit, in robotics, on the battlefield, and in entertainment. Yet even with this focused scope, we are still facing a lot of challenges and an opportunity to explore a vast body of knowledge in order to deliver effective and pleasing user interfaces and user experiences. In contrast to several other books on general concerns in HCI, this book goes deeper in the specific organizational context by integrating organizational tasks and user characteristics closely into the development of HCI.

AUDIENCE
This book is designed primarily as a textbook to meet the needs of students learning HCI for designing organizational information systems. It is intended to meet the teaching and learning challenges of an upper-division undergraduate or graduate course in human–computer interaction within a major in Management Information Systems, Electronic Commerce, Computer Information Systems, Information Studies, Information Management, Library and Information Science, and Instructional Design in Education. The book is designed to have no prerequisites. The book can also be used for other courses such as Interface Design, Human-Centered Information Systems Development, and Information Systems Project Management.

In addition, this book can be used as a professional reference book for those who design and develop real-world interactive information systems. It is intended to provide theoretically informed design principles and guidelines, as well as step-by-step procedures and methodologies for organizational IT professionals who are familiar with daily organizational issues and their impact on designing effective human interactions with organizational information systems.

In recent years, HCI topics have been included in relevant IS curricula such as the Model Curriculum and Guidelines for Graduate Degree Programs in Information Systems (MSIS 2000, MSIS 2006) jointly charged by ACM and AIS, and the Information Systems-Centric Curriculum (ISCC '99). The MSIS 2000 curriculum identifies human factors as a career elective course. Its next version of MSIS curriculum (MSIS 2006) includes HCI materials as IS core courses in both the Analysis, Modeling, and Design part and the Societal Implications part. The ISCC '99 curriculum emphasizes human behavior and computer interaction as an industry-defined attribute of an IS graduate, and HCI as one of the knowledge components. HCI courses have been offered in schools and programs such as E-Commerce, Information Systems, Information Management, Library and Information Science, and Instructional Design; all are non–computer science programs.

The three authors, combined, have been teaching HCI courses at the upper-division undergraduate, graduate, and doctoral levels for many years, both in the United States and in other countries such as Canada, Israel, and England. The students in these courses are often from non–computer science programs as mentioned above. We have been frustrated with our inability to find appropriate textbooks for these courses and have been developing our own teaching materials over the years. We found that most existing textbooks target computer science or computer engineering students and pay less attention to the uniqueness of non–computer science programs. The emphasis
of these non–computer science programs tends to be more application-oriented. They take contexts into consideration, pay more attention to the big picture, and pay less attention to the technical or programming details.

ORGANIZATION

The book has four sections with a total of fourteen (14) chapters:

The Context section provides the environments, context, and business needs. The goal is to motivate students by letting them see the relevance and importance of HCI issues in organizational IS and the bigger picture/context of where HCI issues fit in. Concrete and easy-to-connect-to examples are used.

The Foundation section covers the necessary understanding of basic interactive technologies and human factors. Specifically, we emphasize different and relevant human physical, cognitive, and affective characteristics that affect HCI development. We introduce the current interactive technologies and commonly used interaction styles. This assumes that we use these technologies and interaction styles as building blocks for HCI development. This is where our book is different from traditional HCI or more CS-oriented HCI books where such technologies or styles are the goals of HCI development. This shows that our level of focus or granularity is higher than that of other HCI books.

The Application section emphasizes the processes and deliverables of HCI development. Specifically, we discuss the HCI goals and concerns and how they help form the HCI evaluation metrics. We provide principles and guidelines derived from the Foundation section. We demonstrate how to analyze organizational-level tasks into the lower levels so that they can be supported by human–computer interactions, and how such lower-level tasks can be supported by the specific design options. A human-centered HCI development methodology ties early discussions together to demonstrate the techniques and processes for developing effective HCI for organizational information systems. Many examples are used to illustrate HCI development issues, concerns, and methods. This is the core part of the book, demonstrating the combination of theories (in the Foundation section) and application. It covers what should be considered and how to make it happen when developing HCI for normal/generic and special organizational IS.

The Additional Context section illustrates the need to consider collaborations among users, environmental and organizational changes, and emerging IT development and use changes. It also includes the larger context of society and the global environment. We discuss social issues that are brought about by the information age and interface issues that occur in the development of global software. This coverage indicates the dynamics of the field and challenges of keeping up with HCI development. Sample emerging changes in IT use and impact include ubiquitous computing, social computing, and value-sensitive design. Sample emerging methods for developing IT are open source, component-based software development, and outsourcing.

The following figure depicts the organizing structure of the book as well as the dependencies among the chapters, thus providing a general guide on the order in which the materials in the book are covered. The sequence of chapters begins with the organizational context, follows with the foundation and then the application, and ends with additional context. Although this can be a default way of covering the materials, readers can customize the sequence and content to meet their own needs. Some possible ways of using the book are suggested in the “How to Use the Book” section below.
DISTINCTIVE FEATURES

1. Three organizing themes throughout the text: (1) a multilayer description of HCI (task, semantic, syntactic, and lexical), (2) an analysis of the physical, cognitive, affective, and other resources that are needed for the user activities, and (3) a systematic HCI development methodology. These themes help organize the diverse materials in the foundation chapters and later integrate and apply information in the application chapters.

2. A blend of theory and practice. Although design is not a science, abundant practice failures point out the importance and value of informed design; that is, design ought to be informed by theoretical understanding and empirical research evidence. Thus, our approach is a blend of theory, research, and practice.

3. Book organization. Materials are organized into three main sections. The Organizational and Business Context section shows the relevance of HCI development in organizations; it serves as a foundation to explain the important factors of human, technology, and tasks. The Application section demonstrates design principles and guidelines, evaluation concerns and methods, and HCI development methodology and techniques. The Additional Context section presents additional organizational, social, and cultural issues. It also forecasts other HCI-related issues resulting from the fast development and deployment of the IT field.

4. A grounding of HCI development into the typical modern organizational IS architecture. This architecture includes system functionalities, data and information management, Web-based or other platform front ends, and human interface and interaction.

5. A systematic HCI development methodology. The book provides a human-centered HCI development life cycle methodology that can be incorporated with modern...
information systems analysis and design life cycle methodology for designing effective organizational information systems.

6. An international perspective. The international team of authors, with their broad research and teaching experiences, endeavored to ensure an international orientation by demonstrating culturally diverse designs and emphasizing the need to be sensitive to national and cultural idiosyncrasies.

7. Extensive coverage on building readers’ various skills. Among these skills, analytical skills are crucial for considering the whole spectrum of organizational information systems by pulling together all relevant aspects and perspectives. In addition, the materials and the nature of HCI development require designers to have organizational and managerial skills, both oral and written communication skills, and collaboration skills, as HCI development is by its nature a collaborative effort involving people with different expertise.

PEDAGOGICAL FEATURES

1. Road maps: At the beginning of each chapter, a road map shows the entire book structure and the location of the chapter within it. In the Application section, each chapter has an additional road map of HCI development methodology to indicate the role of the chapter in the HCI development process.

2. Learning objectives: These appear at the beginning of each chapter to give instructors and students a clear goal of the chapter.

3. Sidebar boxes: These highlight the important concepts and keywords for easy access.

4. Abundant examples: Examples appear inside each chapter to illustrate ideas and facilitate discussions.

5. Additional information: Scattered throughout the text are boxes containing personal stories, examples, industry reflections, and other information that can be skipped if time is a concern but can add fun for students to read.

6. Summary of key concepts: A summary appears at the end of each chapter for easy review of the material covered.

7. Further readings and references: This section appears at the end of each chapter to provide deeper and broader coverage of the topics, as well as the sources of the main ideas in the chapter.

8. Exercises: Each chapter provides exercises of different types and with various levels of difficulty.

9. Illustrative cases (fictional): Segments of the cases appear throughout the entire book to illustrate the key points and main concepts in each chapter.

10. An instructor resource kit: This provides a full set of lecture presentations in PowerPoint, sample solutions to the exercises, sample syllabi for different types of students or emphasis, and teaching suggestions and hints.

11. Companion Web site: This site provides the Web pages for the illustrative cases at various stages of development and testing, launch pages and links to resources and examples, full-color figures (from black-and-white figures in book), and other pedagogical aids.
HOW TO USE THE BOOK

The book is constructed to fulfill the learning goals of an HCI course for one regular semester (14–15 weeks for three hours/week). However, the book can be customized to fit other scheduling needs. For example, we have used the book for a semester-long course with shorter meetings by leaving Chapters 2 through 6 as guided readings rather than materials covered in class meetings.

Besides the chapter sequence mentioned above, this book can be used in different ways or with different emphases depending on the background and interests of the students. The following are some suggestions.

Chapter 2 (Organizational and Business Context) can be skipped or quickly reviewed for students who have taken courses such as Introduction to Management Information Systems and who thus already know the basic organizational information systems. However, the HCI aspects of the organizational context are emphasized in this chapter and should be pointed out to the students. For other students who have not studied such systems and business context, Chapter 2 is important in order to provide an appropriate context for the rest of the materials in this book.

Some materials in Chapters 4, 5, and 6 can be either skipped or quickly reviewed for students with psychology or human factors backgrounds. Yet, for other students, these materials demonstrate the important human aspect in HCI development.

Chapter 12 can be lessened if a course is designed to focus specifically on developing individual-based interactive systems.

Chapter 13 is important for courses with an emphasis on social, global, and/or ethical considerations. Chapter 14 is about trends and challenges in developing HCI with fast IT development and use. These two chapters can be optional if a class is very specific on a particular type of interactive system, emphasizing hands-on HCI development, or has time constraints and cannot cover the whole book.

For higher-level students (such as some graduate students) and readers who are more interested in theory than practice, we suggest more emphasis on Chapters 3 through 6. For others who are more interested in hands-on applications (such as undergraduate students), we suggest putting more effort into Chapters 7 through 11. Overall, however, we suggest giving exposure to all the chapters to some extent in order to provide a holistic picture of the complexity of HCI development and the importance of each component.

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