Preface

Information and communication technologies are advancing fast. Processing speed is still increasing at a high rate, followed by advances in digital storage technology, which double storage capacity every year. In contrast, the size of computers and storage has been decreasing rapidly. Furthermore, communication technologies do not lag behind. The Internet has been widely used, as well as wireless technologies. With a few mouse clicks, people can communicate with each other around the world. All these advances have great potential to change the way people live, introducing new concepts like ubiquitous computing and ambient intelligence.

The vision of ubiquitous computing and ambient intelligence describes a world of technology which is present everywhere in the form of smart and sensible computing devices that are able to communicate with one another. The technology is nonintrusive, transparent and hidden in the background. In the ambient intelligence vision, the devices collect, process and share all kinds of information, including user behavior, in order to act in an intelligent and adaptive way.

Although cryptography and security techniques have been around for quite some time, emerging technologies such the ones described above place new requirements on security with respect to data management. As data is accessible anytime anywhere, according to these new concepts, it becomes much easier to get unauthorized data access. Furthermore, it becomes simpler to collect, store, and search personal information and endanger people's privacy.

In the context of these trends this book provides a comprehensive guide to data management technologies with respect to security, privacy, and trust. It addresses the fundamental concepts and techniques in this field, but also devotes attention to advanced technologies, providing a well-balanced overview between basic and cutting-edge technologies. The book brings together issues on security, privacy, and trust, discusses their influences and dependencies. It starts by taking a step back to regain some perspective on the privacy and security issues of the modern digital world. To achieve this, the book not only lists and discusses privacy and security issues, but gives the ethical and legis-

lation background in the context of data storage and processing technologies, as well as technologies that support and implement fair information practices in order to prevent security and privacy violations.

The main goal of the book is, however, to clarify the state of the art and the potential of security, privacy and trust technologies. Therefore, the main part of the book is devoted to secure data management, trust management and privacy-enhancing technologies. In addition, the book aims at providing a comprehensive overview of digital asset protection techniques. The requirements for secure distribution of digital assets are discussed form both the content owner and consumer perspective. After that, the book gives an overview of technologies and standards that provide secure distribution and usage of information, namely digital rights management, copy protection, and watermarking.

Finally, as a viable route towards ambient intelligence and ubiquitous computing can only be achieved if security and confidentiality issues are properly dealt with, the book reviews these newly introduced issues as well as technological solutions to them.

Intended Audience

This book is directed towards several reader categories. First of all, it is intended for those interested in an in-depth overview of information security, privacy and trust technologies. We expect that practitioners will find this book a valuable reference when dealing with these technologies. System architects will find in it an overview of security and privacy issues, which will help them to build systems taking into account security and privacy requirements from the very beginning. System and software developers/engineers will find the theoretical grounds for the design and implementation of security protocols and privacy-enhancing technologies. In addition, the book includes more advanced security and privacy topics including the ones that arise with the concepts of ambient intelligence. As the book covers a balanced mixture of fundamental and advanced topics in security and privacy, it will be of interest to researchers, either those beginning research in this field or those already involved. Last but not least, we have made a considerable effort to make this book appropriate as a course book, primarily for undergraduate, but also for postgraduate students.

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