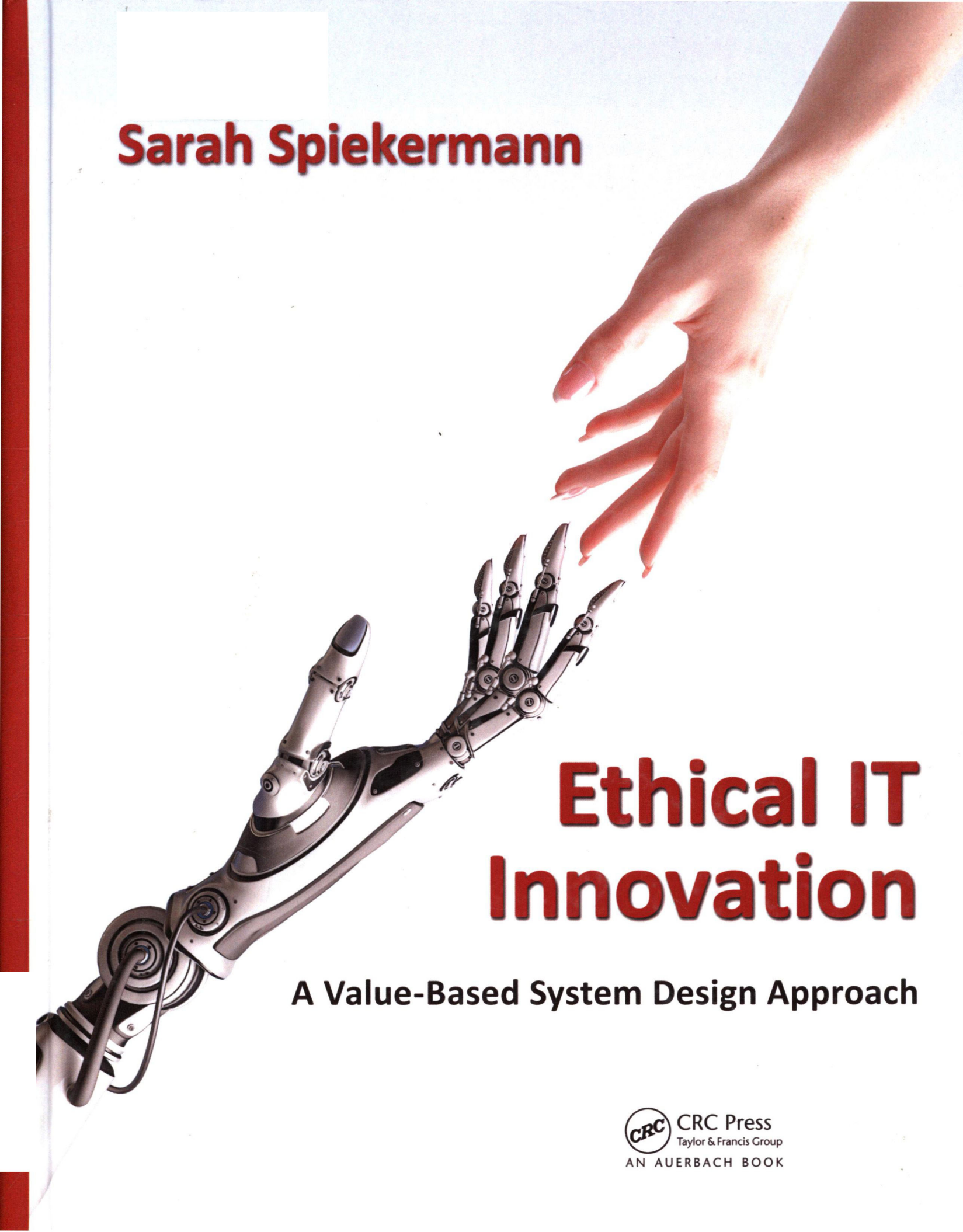


A human hand with pink nail polish is reaching down from the top right corner, while a silver robotic hand reaches up from the bottom left corner. They are positioned as if about to shake hands, symbolizing the intersection of human and artificial intelligence.

Sarah Spiekermann

Ethical IT Innovation

A Value-Based System Design Approach

 **CRC Press**
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AN AUERBACH BOOK

"... a breakthrough volume. It will stand as essential reading and a primary reference in the further development of ethics and IT design, most especially as informed by virtue ethics approaches."

—Professor Charles Ess, University of Oslo

"A fascinating, remarkable journey about the importance of ethics in the design and application of modern information technologies. Deeply researched and engrossing—a book all innovators should read."

—Professor Alessandro Acquisti, Carnegie Mellon University

"Full of clear and compelling examples, this book is an excellent guide for students, professional engineers, and for managers who want to ensure ethics and values are among the concerns teams account for during design."

—Professor Katie Shilton, University of Maryland

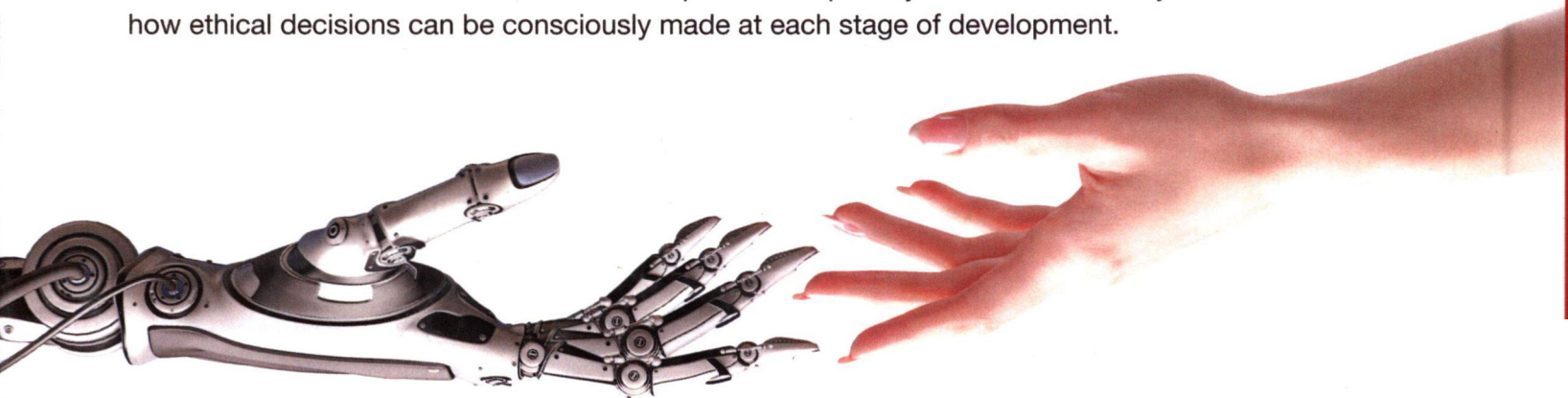
"I will take this book with me to technical conferences and meetings, and also keep a copy on my desk, both to refer to and to find relevant works in the literature list. **Ethical IT Innovation** is an important book that will hopefully have an impact in academic discourse, and, possibly more importantly, in shaping our information systems in the future."

—Bendert Zevenbergen, PhD student, Oxford University

Explaining how ubiquitous computing is rapidly changing our private and professional lives, **Ethical IT Innovation: A Value-Based System Design Approach** stands at the intersection of computer science, philosophy, and management and integrates theories and frameworks from all three domains.

The book explores the latest thinking on computer ethics. It begins by making the case as to why IT professionals, managers, and engineers must consider the ethical issues when designing IT systems, and then uses a recognized system development process model as the structural baseline for subsequent chapters.

Presenting an extensive case study that applies the "Ethical SDLC" to the example of privacy protection in RFID-enabled environments, the book explains how privacy can be built into systems and illustrates how ethical decisions can be consciously made at each stage of development.



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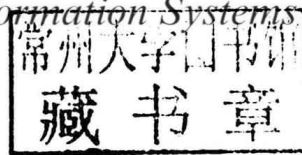


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*Vienna University of Economics and Business
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Advance Praise

Dr. Spiekermann's book is nothing short of a watershed volume, one that is extraordinary in several ways. First, it develops an exceptionally practical approach to ethics in IT design. Central to this practical approach is its solid pedagogy: it is carefully crafted to help students as well as interested professionals in the IT industries develop a better understanding of ethics and how ethics can be usefully interwoven in the design and development of information and communications technology (ICTs). Indeed, a primary virtue of the book is that it is clear and accessible to these audiences as it is written by someone with long experience in and deep understanding of IT in business and professional terms. At the same time, the work is exceptionally well informed in philosophical terms. Indeed, both beginning students and advanced scholars in Information and Computing Ethics (ICE) will profit from reading this text. In these ways, the book thus stands as an exceptional synthesis and bridge between two sets of disciplines and cultures that are otherwise, to put it mildly, difficult to bring together—both theoretically, and certainly in the most practical terms, i.e., of integrating philosophical ethics in the design and development of ICTs.

Perhaps best of all (certainly from my perspective), Dr. Spiekermann not only takes up the requisite and usual

attention to both utilitarian and deontological ethics; more fundamentally, the book stands solidly in the tradition of virtue ethics as applied to ICTs from the very beginning of computer ethics in the work of Norbert Wiener. Even more importantly, as Dr. Spiekermann makes clear, virtue ethics is becoming ever more useful and important in our efforts to ethically evaluate and guide the design of digital technologies—i.e., in hopes of developing these technologies so that they indeed contribute to flourishing lives. The book incorporates much of the most recent and important research and scholarship in virtue ethics and IT, and at the same time, Dr. Spiekermann significantly expands upon this work through her more extensive syntheses between IT design and philosophical ethics, and so establishes a new level of accomplishment and contribution within both domains.

The book is thus a breakthrough volume; it will stand as essential reading and a primary reference in the further development of ethics and IT design, most especially as informed by virtue ethics approaches.

Charles Ess, Professor
University of Oslo

Ethical IT Innovation

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List of Abbreviations

AI	Artificial intelligence	IT	Information technology
AR	Augmented reality	NPD	New product development
AU	Act utilitarianism	NPV	Net present value
CIA	Confidentiality, integrity, availability	PET	Privacy enhancing technology
CRM	Customer relationship management	PIU	Problematic Internet use
CSR	Corporate social responsibility	POS	Point of sale
CST	Critical system thinking	RFID	Radio-frequency identification
e-2-e	End-to-end	ROI	Return on investment
ERP	Enterprise resource planning systems	RU	Rule utilitarianism
E-SDLC	Ethical system development life cycle	SAR	Specific absorption rate
EUD	End-user development	SDLC	System development life cycle
GU	General utilitarianism	SME	Small and medium enterprise
HBR	<i>Harvard Business Review</i>	SOX	Sarbanes–Oxley Act
HCI	Human–computer interaction	UML	Unified modeling language
IP	Intellectual property	UX	User experience
IS	Information systems	VR	Virtual reality

Preface

“To lift a weight so heavy, Sisyphus
Would take your courage,
Although one’s heart is in the work
Art is long and Time is short.”

Charles Baudelaire (1857)

Hardly a day passes without news of a large-scale privacy or security breach: incidents where personal data or entire identities are stolen or misused, where critical systems are hacked or destroyed by malicious attackers. Edward Snowden revealed how governments and companies abuse our information technology (IT), recording every step or social media post and using this knowledge to increase their power and profit. But this is just the tip of the iceberg. Economies now lose billions in productivity from knowledge workers who are constantly distracted, interrupted, and tempted by IT systems. Family lives, friendship, and intimacy suffer as conversations are constantly interrupted and people become addicted to their IT devices. Millions of people escape into the fantasy of virtual worlds and social networks, living out dreams that reality doesn’t hold ready for them. The price of escape is often physical and mental health problems, as the body is forgotten by the straying mind.

Another textbook on computer ethics was titled *Goblet of Fire*, referring to the Greek myth where Prometheus brought fire to humanity. I agree with this analogy; IT is like fire. IT enables enormous leaps in progress, leading humanity into a new, potentially better age. But like fire, it is also dangerous in that IT can harm human values. As we play with fire today, we are often burned. This textbook is written for those who understand that our current way of developing IT systems and investing in them is a bit like playing with fire and has problems. It is for those who want to construct IT as a benevolent power rather than an unregulated force of destruction.

To bring order and control to IT, we must first understand its goals. We must understand its desired properties and then choose the right methods to cater IT to those properties. This is what this textbook is about. After introducing concepts of IT innovation and the future of IT, I describe the ethical values that matter to humans and human societies

across the world. I detail what these values stand for and how they relate to IT. I explain how to build IT so that it accommodates the things we all care about: intrinsic values like freedom, knowledge, health, safety and security, trust, belonging and friendship, dignity and respect, and qualities that support these intrinsic values, such as privacy, transparency, control, truth, fairness, accessibility, objectivity, authenticity, accuracy, accountability, empathy, reciprocity, and politeness.

Why is the concept of Sisyphus’ rock so important that I quote it above? First, building IT is a Sisyphean task. You engineers have to pay attention to the implications, uses, and abuses of your systems, their true requirements and to the details of your code. If you do not, you will never reach the mountaintop. Once a program runs well, it feels like sitting on the mountaintop. But Baudelaire warned you, warned us: *L’Art est long et le Temps est court* (“Art is long and time is short”). To create real art, which I equate here with good IT systems, you need to invest time—time that is usually too short. If you do not invest the time, then you will not produce anything that deserves to be called art; the IT will not be good. This book propagates the idea that thinking and crafting IT for value need time. They need the patience of Sisyphus. Those who are not willing to invest time build second-class objects that create more entropy than good.

Sisyphus had to meticulously roll his rock up the hill, and he could not stand still until it was at the top. Once it was there, it rolled down again and he had to start anew. At times, a message of this nature and size feels like a big rock. This book is large in ambition and scope, and its knowledge spans four disciplines: philosophy, computer science, psychology, and management. With four disciplines embedded in this work, it has become a rich and dense piece. When four disciplines are forming a mosaic, a beautiful new landscape emerges—a landscape in this case of an artful future IT environment. That said, I am aware that this work cannot stop here. The rock will roll down the hill again. Many scholars will probably turn to me and outline more insights that I could have or should cover. Future editions might therefore become necessary.

Discussing the Sisyphus myth, Nobel laureate Günther Grass once said:

“Sisyphus is nothing else than the insight that the rock will not stay on the mountaintop—and to consent to this. Ideology always promises mankind that the rock will stay on the mountaintop one day. This would be paradise. All utopia work with this promise.”

I must confess that writing about ethical IT reflects my ideology; it is an “evangelizing” exercise. Of course, I would

like to promise that if you engineers and managers built IT systems with the ideology of this book in mind, the world would become a better place (the rock would stay on the mountaintop). And I really believe that! But I must acknowledge that much more exists than I have written about here: many more views, many more values, and a history of values that will progress. So, humbly, the only thing I can do is urge you to face the rock, take the time and use your art and virtuousness to create value instead of entropy!

Acknowledgments

Writing this book forced me into some isolation. But unlike Sisyphus, I was not truly alone. I would therefore like to thank the 20 people who helped me in this endeavor. Most important, I thank my husband, Johannes, who lightened these days of hard labor through his presence. Without him, I do not know how I could have made it. But emotional support also came from my team at Vienna University of Economics and Business, who constantly interacted with me. My greatest thanks go to Alexander Novotny, my PhD student at the time, who gave me in-depth feedback for every chapter. Later, Domink Berger, Peter Blank, and Roswitha Kreitner took over and helped me to round out all the chapters. Sandra Paulhart did an enormous job digging out the computer ethics literature on relevant values in IT. My PhD students Jana Korunovska and Olja Drozd recommended changes to Chapters 5, 8, and 10. Very important to this book is Julian Cantella. He did all of the English language editing and thoroughly revised everything I wrote. Finally, Marthe Kerkwijk found the original citations for all the philosophical works cited in this book.

In addition to this comprehensive support, many experts took the time to read those chapters where they are recognized specialists. Professor Johannes Hoff (Heythrop College, University of London) revised all the chapters that address philosophy (Chapter 4 on value ethics, Chapters 5 and 6 on knowledge and freedom, Chapter 11 on dignity

and respect, and Chapter 15 on wise leadership). Professor Thomas Gross (University of Newcastle) and Magister Stefan Strauß (Institute of Technology Assessment, Vienna) revised Chapter 8 on IT security and safety. Professor Katie Shilton (University of Maryland) gave feedback on Chapters 4 and 5 on value ethics and ethical knowledge. Dr. Christof Miska (Vienna University of Economics and Business) gave feedback on Chapter 15 on leadership. And Ulrike Rauer (PhD student at the Oxford Internet Institute) helped to improve Chapter 7 on health.

Besides these academic experts, I also received in-depth comments and revisions from industry. In particular, Dr. Peter Lasinger (investment manager at Austria's premier seed-funding investment company) provided great feedback to Chapter 2 on innovation, Chapter 13 on system design, and Chapter 15 on leadership. Stephane Chaudron (from the Digital Citizen Security Unit of the European Commission's research unit JRC) provided insightful comments and ideas for my future scenarios described in Chapter 3. Peter Bubestinger from the Free Software Foundation revised Chapter 6 on freedom, Chapter 11 on dignity, and Chapter 13 on system design. Finally, IT thought leaders and senior managers took the time to read and provided important comments, in particular, Magister Gregor Herzog and Jakob Haesler. I am deeply indebted to all of these wonderful supporters.

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Sarah Spiekermann chairs the Institute for Management Information Systems at Vienna University of Economics and Business (WU Vienna). She has published more than 70 articles on the social and ethical implications of computer systems and given more than a hundred presentations and talks about her work throughout the world. Her main expertise is electronic privacy, disclosure behavior, and ethical computing. Spiekermann has coauthored US/EU privacy regulation for radio-frequency identification (RFID) technology and regularly works as an expert and adviser to companies and governmental institutions, including the EU Commission and the Organisation for Economic Co-operation and Development (OECD). She is on the supervisory board of the Foundation of Data Protection of the German Parliament.

She also maintains a blog on “The Ethical Machine” at Austria’s leading daily newspaper *Standard.at* and is on the board of the Austrian art and science think-tank GlobArt. Before being tenured in Vienna in 2009, Spiekermann was assistant professor at the Institute of Information Systems at Humboldt University Berlin (Germany), where she headed the Berlin Research Centre on Internet Economics (2003–2009), was adjunct visiting research professor with the Heinz College of Public Policy and Management at Carnegie Mellon University (Pittsburgh, Pennsylvania, 2006–2009), founded and shut down the company Skillmap (visualizing social networks; 2008–2011), and worked as a management consultant and marketing manager with A.T. Kearney and Openwave Systems.

