The production and service of the 21st century is based on distributed or networked organizations. The denomination of these organizations can be different (extended-, virtual-, smart-organization, etc.), but there are some main important common characteristics. In this type of organizations, flexible, independent organizational and production units are working together, reacting in an intelligent way to the challenges and uncertainty of the environment while using some type of communication network (wired or wireless). In case of the so-called “smart organizations,” the integration of information and communication technologies (ICT), knowledge and organizational networks form the background of operation.

As the base of networked organizations is the interdependent, separate production and service teams and units, the cooperation and collaboration among them is of vital importance. The structure, the communication systems, and the collaborating people, teams, and organizations that define today’s organizations characteristics must be harmonized to accomplish complex, demanding tasks. The collaboration means contacts among users, so human beings have outstanding importance in the operation.

According to experience, the improper application of this human factor can make the operation very inefficient, even in the case of the technically most advanced systems. The lowest level of connection among systems is made through protocols; the highest contact level is among the decision-makers, the human connections. A very important element of this human contact is the
trust. In a smart organization, trust is the flavor, the medium in which players are moving. Only trust can bridge the cultural, geographical, and organizational distances of humans (and even of firms) avoiding problematic situations.

Due to the rapidly developing information and communication technologies, the complexity of the networked organizations are becoming very high, so the representation of their structure, the description of their operation, and their control needs new technologies and approaches. In today’s turbulent environment, only those organizations that effectively apply the results of the different disciplines can survive. Smart organization belongs to this kind of category.

The purpose of the book is to introduce the methodologies, approaches for describing the structure, the smooth operation, the communication, and knowledge-handling of smart organizations in an integrated way. The value of the book is bringing together the theories applied in different fields. In the book, the main regulation aspect was how these theories can be applied in describing and solving various demands of smart organization. The book covers the state-of-the-art concepts and methodologies of smart organization development, taking into account the current results in information and communication technologies, and will outline also the trends of the fields.

**Organization of the Book**

The book contains ten chapters written by professional researchers coming from the field of academics and industry. The chapters have been organized into four interrelated sections.

**Section I: Main Characteristics of Smart Organizations.** The chapter in this section makes an overview of the main characteristics of smart organizations.

*Chapter I.* The chapter titled “Smart Organizations in the Digital Age” authored by Filos presents and explains the concept of the smart organization. This concept arose from the need for organizations to respond dynamically to the changing landscape of a digital economy. A smart organization is understood to be both internetworked and knowledge-driven, and therefore able to adapt to new organizational challenges rapidly and sufficiently to create and exploit knowledge in response to opportunities of the digital age. The three networking dimensions of smart organizations, ICT-enabled virtuality, organizational teaming, and knowledge hyperlinking, are elaborated. This networking capa-
bility allows smart organizations to cope with complexity and with rapidly changing economic environments. The chapter also shows how managing the smart organization requires a more “fuzzy” approach to managing smart resources: people, information, knowledge, and creativity. Some research work is also presented, mainly from the European perspective.

Section II: Technologies for Operation of Smart Organizations. These chapters introduce technologies appropriate to increasing the effectiveness of the operation of smart organizations.

Chapter II. The dynamism is an important factor of smart organizations. Varga, in his chapter “Applications of Agent-Based Technologies in Smart Organizations,” introduces agent technology as a means of creating dynamic software systems for the changing needs of smart organizations. The notion of agency is introduced, and individual and collective agent architectures are described. Agent interaction methods and agent system design techniques are discussed. Application areas of agent technology are overviewed. The chapter argues that the autonomous and proactive nature of agent systems makes them suitable as the new information infrastructure for the networked components of dynamically changing smart organizations.

Chapter III. In this chapter, “The HUB as an Enabling IT Strategy to Achieve Smart Organizations,” Molina, Mejía, Galeano, Najera, and Velandia introduce the concept of Virtual Enterprise Broker (VEB) supported by the use of a “hub” of integrated e-services as an enabling IT strategy to design and create smart organizations. The VEB model is described in terms of core processes, success measures, and supporting information and communication technologies. The VEB is a business entity that enables the design, configuration, creation, and operation of smart organizations. VEB core processes are supported by e-services integrated in a “hub” (the concept of hub refers to a proposed centre of integrated e-services for virtual business) that is supported by Web-based applications and technologies. Six integrated e-services have been defined, based on the concept of on-demand services for value added industrial networks: e-marketing, e-brokerage, e-planning, e-engineering, e-supply and e-productivity. The conjunction of these e-services improves industrial networks performance. A description of the e-services and hub architecture is presented in detail.

Section III: Knowledge- and Human-Centered Technologies in Smart Organizations. Two chapters in this section deal with different aspects of handling knowledge in smart organizations. The third chapter focuses on the role of trust in smart organization.
Chapter IV. Handling and management of knowledge is a basic task in smart organizations. The chapter “Knowledge Management in Smart Organizations,” authored by Chan, looks at the deployment of appropriate information and communication technologies in helping smart organizations manage knowledge. Taking a management perspective, smart organizations can be regarded as those that can make smart strategic decisions and put into practice such managerial principles as value creation, continual learning, embracing uncertainty, and empowerment. Making good decisions would involve gathering and synthesizing the appropriate knowledge—knowledge about the market, products, suppliers, customers, competitors, and others. Different schools of knowledge-management theories and the related technologies are discussed.

Chapter V. Virtual teams are basic units of networked organizations. The uniqueness of multidisciplinary teamwork is in its potential to integrate different bodies of knowledge into a new synergy. However, previous empirical studies have shown that member heterogeneity and geographic separation hinder effective sharing and use of team knowledge. In “Bridging Diversity across Time and Space: The Case of Multidisciplinary Virtual Teams,” Ratheeva explores how such teams interact to overcome the barriers and take advantage of their “built-in” knowledge diversity. The findings indicate that often teams lack common background knowledge at the beginning of the projects, and in order to resolve differences members rely on their external intellectual and social communities. The reported research establishes a positive correlation between team members’ participation in multiple professional and social networks, and teams’ abilities to successfully build on their knowledge diversity. The findings also suggest a need to reconceptualize the boundaries of multidisciplinary teams and to consider the processes of sharing diverse knowledge in a wider social context.

Chapter VI. Nowadays, many enterprises manufacture and distribute their products or services globally, and quite a number of smart organizations are formed on the Internet and are expected to evolve to a strategically important e-business model. Although information and communication technologies and knowledge management play an important role in linking the core and partner companies, it remains subservient to the humans that form the smart organizations. The “Neural Data Mining System for Trust-Based Evaluation in Smart Organizations” chapter, authored by Wong, identifies two instances in which trust-based evaluations of partners in the smart organizations are applicable. A review of the literature indicates that neither researchers nor practitioners agree on a single model of interfirm trust that applies to all partner evaluation contexts. A decision-support system based on neural network and data min-
ing technologies is proposed. A case example is given to illustrate a trust-based evaluation in a real situation.

**Section IV: Communication and Security Technologies for Smart Organizations.** One of the three basic factors of smart organization, the communication technologies and their security, is introduced in this section.

**Chapter VII.** The chapter entitled “New Challenges for Smart Organizations: Demands for Mobility – Wireless Communication Technologies,” written by Mezgár, introduces the different types of wireless technologies that can be applied in smart organizations (SO). Smart organization is an outstanding representative of networked organizations, as its organization structure, communication, and knowledge-based applications are coordinated and all networked. The chapter describes the communication demands of SO, taking care on wired and especially wireless networks that offer mobility for users. Access at any time from anywhere to enterprise information for registered users guarantees mobility, a basic demand for a dynamic organization today. Security, trust, and interoperability aspects are also discussed as important characteristics of the up-to-date infocom systems. Finally, the main impacts of wireless technologies on smart organizations are summarized. Through the survey of structure and operation of wireless technologies and their impacts, it is easy to understand that wireless communication technology has a strategic role in the effective, competitive operation of networked organizations.

**Chapter VIII.** In a rapidly changing world, continuous adoption of new practices is crucial for survival; organizations embracing the latest technologies have a competitive edge. Smart organizations readily take onboard new organizational forms and practices, those in particular that offer agility and responsiveness. The Internet and the World Wide Web offer a new way of collaboration via Web services, but heterogeneity of different service components make cooperation difficult. Bertok and Xu describe in this chapter “Infrastructure Support for Smart Organizations: Integration of Web Service Partners in Heterogeneous Environments,” a new approach to combine Web services by employing a layered structure in which composition of a value-added service can be built from individual components, and each service component can have semantically equivalent but syntactically different alternatives.

**Chapter IX.** In the past few years, grid computing and grid development have become one of the most remarkable and most generously financed topics within computer science. At the same time, only the most well-informed IT experts and researchers know what it really means and tries to achieve. In the “Grid Technology for Smart Organizations” chapter, Sipos and Kacsuk make
a difference. First, the chapter discusses the basic goal of grid computing, then shows the latest, service-oriented grid approach by introducing two technologies that have been developed for distributed systems. The first one is Web services and its grid extensions OGSA, while the other one is Jini. In the second part of the chapter, the authors introduce their prediction about the future of grid computing and the basic role it will probably have in the life of smart organizations.

Chapter X. In this chapter, “Communication Security Technologies in Smart Organizations,” Phan introduces the security technologies that are important in guaranteeing the high quality of communication within smart organizations. First, the various forms of communication that can be used in the current information age are briefly reviewed before outlining the possible threats that can be faced in each communication medium. Then, the relevant security technologies are described that help to protect communication media from common threats, as well as the security tools available in the market that implement these technologies. The topics discussed in this chapter would serve to educate the smart organizations toward securing their various means of communication, which is vital for a business establishment to exist and coexist with peers and partners.

The editor hopes that the book will be a useful summary of ideas and forecasts needed to develop and operate smart organizations. In the book, there are detailed discussions of different methodologies, concepts, and technologies required for handling and exchanging knowledge and information, and for safe communication via different media in virtual environments and in smart organizations.

The chapters offer practical suggestions for developing and operating different subsystems of smart organizations. Thus, undergraduate and graduate students could use the book when taking courses in knowledge management, communication technologies, networked organizations, and some related areas. Practitioners also could be interested when seeking to better support and raise the level of their decision-making processes. Applying an existing theory in a new field or integrating different theories to solve a new problem always generates additional motivation. Hopefully, there will be also some results introduced that can generate new ideas in the readers, inspiring new research works or new directions as well.

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December 2005

Budapest, Hungary