Infonomics for Distributed Business and Decision-Making Environments:
Creating Information System Ecology

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In this chapter, a proposition of so-called infological interpretation of information is presented. The concept was formulated by Bo Sundgren (1973) in his publication devoted to data bases. Sundgren developed a consistent theory of a model of data base based on the concept of message as a specific set of data. The model inspires not only a new interpretation of information but also is a good base for manifold analysis of the concept. In the chapter, the following basic concepts are disused: properties of information, diversity of information, and information space.

Various models and methods are used to support information system development process, but after many years of practice, projects still continue to fail. One of the reasons is that the conventional modeling approaches do not provide efficient support for learning and communication among stakeholders. Lack of an integrated method for systematic analysis, design and evolution of static and dynamic structures of information system architectures is the core of frustration in various companies. Semantic problems of communication between business analysis and design experts lead to ambiguous and incomplete system requirement specifications. The traditional modeling approaches do not view business data and process as a whole. The goal of this chapter is to propose a method, which would help system designers to reason about the pragmatic, semantic and syntactic aspects of a system in a communication and learning perspective. Service-oriented paradigm was shortly presented as one of the possible solutions to the problems of integration.

Section 2
Information Management Progress

In a modern enterprise environment, many information resources are available to people working to produce valuable output. Due to technology proliferation, remote work access, and multiple geographical locations generating their own solutions for local infrastructure challenges, as well as the fact that modern professionals are tasked to make decisions autonomously, it is not self-evident what types of information resources could or should be accessed in what order in order to move processes towards

the desired product outcome. The integrated model described in this chapter was developed using the results of an empirical study. The model puts a user-centered focus on business process model building by mapping all information interactions surrounding the business processes (i.e. creation, storage, management, retrieval of documents/contents as well as information and data). The model characterizes the business processes by types of information interaction, analyzes process phases by those interactions and evaluates actual locations of information content extractions.

E-business today has moved focus to information sharing and integration across organisational boundaries in an effort to transform business processes throughout the value chain and standardize collaboration among communicating entities. Healthcare comprises a strongly collaborative distributed business environment in which information value plays a strategic role and informational privacy comprises a great concern. This new era in e-business, however, is followed by a series of issues that need to be addressed both at application and infrastructural level, such as information heterogeneity, system interoperability, security and privacy. The Grid as a technology enables sharing, selection, and aggregation of a wide variety of distributed resources comes to fill these gaps. In this chapter, the communication of information among healthcare organisations operating over a Grid infrastructure will be presented and analysed both from a technical and a business perspective.

The chapter is focused on the usage of intelligent agents in business process modelling and business process management systems in particular. The basic notions of agent-based systems and their architectures are given. Multiagent systems as sets of multiple interacting software agents, as well as frameworks and methodologies of their development are discussed. Three kinds of architectures of agent-based systems – holons, multi-multi-agent systems and aspect-oriented architecture are described. Examples of already implemented agent-based systems in logistics, transportation and supply chain management are given. The chapter gives an insight into recent business process management systems and their architectures, and highlights several issues and challenges which underpin the necessity for agent-based business process management. Methodologies and implementation of agent-based business process management systems are discussed and directions of future research in this area are outlined.

The rapid development of information communication technology (ICT) encourages companies to compete. However, those competitive development goals should enable people to satisfy their own needs and enjoy a better quality of work and life without compromising the quality of life of other people and future generations. Corporate governance models are needed to concentrate on changes of existing rules, customs, practices and rights as the subject matter of governance to be influenced. Governance models must recognize the limitations of the overburdened state and the consequent need to take advantage of existing institutions and structures that promote sustainability. An increasing number of companies are moving into new forms of competition which can be described as information-based competition, knowledge-based competition, technology–based competition and ICT relationship-based competition. However, unlimited supply of information from Internet and other sources, easiness to register and transfer the information, reduced prices of ICT devices result in increase of information processing and its overload. Therefore, information governance model proposed in the chapter seems to be a pattern to deal with information in contemporary common organizations i.e. virtual heterarchical organizations where access to information is democratically permitted. The proposed model is to be an answer to ensure sustainable governance of information i.e. balance, stability and progress of information processing.

Section 3
Information Valuation

This chapter deals with the analysis of the value of information in a distributed decision support systems. It characterises the basic measures of the value of information, with the stress put to the utility function, the effect of the knowledge discovery techniques in databases on the value of information and multicriteria methods of decisions support. In the chapter, a multi-agent system is presented, which is an example of a distributed decision support system. In the last part of the chapter, the choice methods and consensus methods for increasing the value of information through the eliminate contradiction of information within the system are presented.

This chapter gives a comprehensive overview of the current status of accounting and billing for up-to-date computing environments. Accounting is the key for the management of information system resources. At this stage of evolution of accounting systems it is adequate not to separate computing environments into High Performance Computing and Grid Computing environments for allowing a "holistic" view showing the different approaches and the state of the art for integrated accounting and billing in distributed computing environments. Requirements resulting from a public survey within all communities of the German Grid infrastructure, as well as from computing centres and resource providers of High Performance Computing resources like HLRN, and ZIVGrid, within the German e-Science framework, have been considered as well as requirements resulting from various information systems and the virtualisation of organisations and resources. Additionally, conceptual, technical, economical, and legal questions also had to be taken into consideration. After the requirements have been consolidated and implementations have been done over one year ago, now the overall results and conclusions are presented in the following sections showing a case study based on the GISIG framework and the Grid-GIS framework. The focus is on how an integrated architecture can be built and used in heterogeneous environments. A prototypical implementation is outlined that is able to manage and visualise relevant accounting and billing information based on suitable monitoring data in a virtual organisation specific way regarding basic business, economic, and security issues.

Chapter 11

The main purpose of this chapter is the comparison of differences between results of three methods used for quality evaluation of individual e-banking services. The comparison has been conducted for selected sixteen banks in Poland. The author uses three types of research: traditional expert scoring method, AHP (Analytic Hierarchy Process) method and conversion method. After a general introduction, a detailed report of the results arising from this research is presented and analyzed. Finally, the author draws general conclusions from the analysis. He also discusses the future research regarding this topic.

Chapter 12

Researchers are currently challenged to document the economic aspects of information across an array of contexts. While some lessons can be applied generally, certain contexts present unique challenges for researchers interested in the acquisition, management, and use of information. Health is one such field currently undergoing a revolution driven by new applications of information-based technologies and services. This chapter provides background on health informatics and current issues as health informatics impacts the provision of health in doctors' offices, shifts the provision of healthcare services into patients' homes, and presents new opportunities to address public health concerns. An outline of a

future research agenda in health informatics and a look at the prospect of health informatics applications provides the necessary foundation for focused work on the economic impact of this information-driven transformation in healthcare delivery.

This discussion focuses on the idea of an information society studied in view of economic aspects. The subject matter of inquiry is a strategic sector decisive for the situation of economy, society and the state: the so-called information sector in the economy. Its importance and intrinsic value are discussed. Studies on economics of the information sector are brought to light as well as relationships with other disciplines, including economics of information (information systems) and information ecology. Based on the Polish Classification of Activities (PKD), the methodology of classification and categorization of the information sector is developed and used to evaluate its development and, indirectly, the development of the information society in Poland. Research is based on available statistics on the number of employed persons and employment in 1997-2006. It is evidenced that the information sector dominates in Poland today (in the four-sector model of the economy) and the trend of its regular growth is observed.

Section 4
Collaboration in Networks

Collaboration is playing an increasing role in business especially given an increase in business networking. Such networks are formed to gain business advantage by combining expertise from many businesses or organizational units to quickly create new and competitive products and services. Most processes in business networks now consist of a number of activities whose processes must be coordinated to reach enterprises goals. This chapter addresses ways of supporting such activities using technology and proposes a collaboration infrastructure that encourages collaboration and sharing of knowledge across the activities.

Technological and organizational excellence is the key element for business success in a modern business environment. In contemporary business environments, companies will restore and keep their competition capability not only by optimizing their own potentials, but mainly by utilizing capability of foreign resources and their connection to complete business process in the so called network organizations. Virtual organizations are a special form of network organizations. Among virtual organizations the so called Living Laboratory takes place. This chapter presents the findings of the research regarding the state of development and application of laser living laboratory management and governance system in Toolmakers Cluster of Slovenia.

Globalization in software development introduced significant changes in the way organizations operate today. Software is now produced by team members from geographically, temporally and culturally remote sites. Organizations seek benefits that global markets offer and face new challenges. Naturally resistant to change, these organizations often do not realize the necessity for tailoring existing methods for distributed collaboration. This empirical investigation shows a great variety in the ways organizations distribute responsibilities across remote sites and conclude that these can be divided into two main categories: joint collaboration that requires investments in team building and independent collaboration that requires investments in knowledge management and transfer. Finally, the authors discuss practices that are applied in industry to overcome these challenges and emphasize necessity to fully understand the pros and cons of different ways to organize distributed software projects before starting a project in this new environment.

This chapter aims to understand the perceptions of employee information ethics using a company within the Environmental Protection Science Park in the southern part of Taiwan. The two purposes of this research are (1) to understand the environments of employees who understand information ethics, and (2) to clarify variables regarding information ethics which could provide a framework for policy controlling information ethics for businesses related to information technology (IT). The findings of this study show respondents understand the concept of unethical or illegal use of IT. All respondents perceived unauthorized behaviors, such as illegal downloads and reading other IT accounts without permission as unethical behaviors.

The aim of this chapter is to examine some of the issues of ethics related to information in DBE. The ethical issue of what is moral to do in order to optimize the use of information in DBE is dealt with. The varied ways of integrating and putting into the practice information in DBE is discussed as well as the great variety of ethical approaches. In the field of ethics of information in DBE we are no longer confronted with "policy vacuum"; we are facing dissipation of ethical responsibility (DER) and this phenomenon leads to difficult and usually late localisation and solving of ethical dilemmas within the system.