

Emerging Topics and Technologies in Information Systems

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The chapter addresses the importance of knowledge-based resources proposing indicators to measure and report technological capital in companies. The first part of the chapter develops a conceptual framework to analyze organizational learning and its outcomes. It focuses on the strategy perspective of organizational learning, addressing its ontology, contributions, and problematics. The second part is focused on a particular type of knowledge—the technological capital—that is institutionalized knowledge in the form of technologies. This section proposes a map for the different types of technological capital of companies: idiosyncratic, core, ancillary, and compulsory. The chapter shows the results of a case study with European firms measuring and reporting technological capital. Finally the chapter summarizes main conclusions for management.

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There is no systematic study of Information Systems (IS) agility in academic and practitioner IS literature and the concept is not well defined. For rigorous academic studies of IS agility, a proper definition/conceptualization of IS agility is needed. To fulfill this objective, existing published work on agility is analyzed. The analysis demonstrates that the existing definitions may need improvement to aid in arriving at a definition of IS agility. A new definition of agility that captures its core properties is proposed. The advantages of this definition over existing definitions is demonstrated and it is used to define IS Agility. Salient features of an agile IS are discussed and the utility of the proposed definition in arriving at attributes of an agile IS is demonstrated. Efficacy and validity of the proposed definition is demonstrated through interviews with IS executives from a diverse set organization. Lastly, avenues for future research are proposed.

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Global Understanding Environment: Applying Semantic and Agent Technologies to Industrial Automation	55
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Vagan Terziyan, University of Jyväskylä, Finland

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Industry pushes a new type of Internet characterized as the Internet of Things, which represents a fusion of the physical and digital worlds. The technology of the Internet of Things opens new horizons for industrial automation, that is, automated monitoring, control, maintenance planning, and so forth, of industrial resources and processes. Internet of Things definitely needs explicit semantics, even more than the traditional Web – for automatic discovery and interoperability among heterogeneous devices and also to facilitate the behavioral coordination of the components of complex physical-digital systems. In this chapter, the authors describe their work towards the Global Understanding Environment (GUN), a general middleware framework aimed at providing means for building complex industrial systems consisting of components of different nature, based on the semantic and the agent technologies. The authors present the general idea and some emergent issues of GUN and describe the current state of the GUN realization in the UBIWARE platform. As a specific concrete case, they use the domain of distributed power network maintenance. In collaboration with the ABB Company, we have developed a simple prototype and vision of potential add-value this domain could receive from introducing semantic and agent technologies, and GUN framework in particular.

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Jeff Hsu, Fairleigh Dickinson University, USA

The market for e-commerce to Chinese audiences is one which has tremendous potential, given the fact that the number of potential users and customers is projected to exceed that of English-speaking Western users. However, managing the host of cultural issues that come up is an important need which must be met. This chapter examines the cultural issues which are relevant to sites targeted at China and Chinese-speaking audiences, including user and consumer behavior patterns, categorizing China using Hofstede's cultural dimensions, examining traditional and historical attitudes, and addressing business issues including trust, payment, and infrastructure challenges. In the chapter design principles based on these are proposed, as well as an examination of the differences between the cultures of China, Taiwan, Hong Kong, and Singapore.

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Enterprise Resource Planning (ERP) is the method of trying to unify all processes within an organization into one software system or database. Enterprise Resource Planning Projects should not be entered into

lightly. Not only are ERP projects a new software program to learn, but they are a new way of thinking. This chapter provides a brief history of ERP; follows by the advantages and disadvantages of ERP for organizations considering the adoption of ERP. The next section introduces various strategies of ERP implementation with a list of ERP software vendors. ERP is a long-term IT investment. The total cost of ownership is analyzed and discussed with several cases of ERP implementation.

Chapter VI

A Secure Characteristics of Wireless Ad-Hoc Networks..... 115

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This chapter reviews the secure characteristics of mobile devices that can use wireless networks (ad-hoc) almost any where and any time, by using one or more wireless network technologies. Currently, most computers communicate with each other by using wired networks. This approach is well suited for stationary computers, but it is not appropriate for mobile devices. These technologies enable the use of infrastructured networks (3GPP) and ad-hoc networks. Furthermore, the authors describe the gateway specification, requirement for implementation for ad-hoc networks. The minimum, essential, and additional functional requirements for effective functionality of gateway are presented in tabular form. At the end, the future functional requirement and the features of multiple ad-hoc networks are also described.

Chapter VII

A Survey on Approaches to Adaptation on the Web..... 136

Jorge Marx Gómez, Oldenburg University, Germany

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Approaches to adaptation have been proposed by many different research communities, Hypermedia System and Intelligent Tutoring in particular. The task of adaptation breaks down to a mediation of resource provision and resource demand. In doing so, it is necessary to obtain some representation of them, either directly or through intermediate models that can be further processed to arrive at this information. Correspondingly, major differences in adaptation approaches manifest themselves in the employed sources, the way they are represented and the techniques used to derive the user demand from them. Therefore, we like to structure this survey according to these model-related aspects.

Chapter VIII

A Personalized Portal on the Basis of Semantic Models and Rules..... 153

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A portal is a Web-based single point of access that delivers information and applications to a user on its own and by the integration of external services. With most portals, various users in the role of customer, supplier, employee, and so forth, can configure the available content and the functionalities in their own way and access them over multitude of devices – mobile phone, PDA, and PC to name a few (Priebe; Pernul, 2003). Whereas this type of portal can be seen as an adaptable system, adaptive portals shall adapt themselves to the individual user.

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This wireless advertising is considered to be an important alternative advertising medium in the future, due to its numerous advantages over traditional media. However, little research has been conducted on consumer acceptance of this medium in particular, in the United Kingdom. This study explores consumers' attitudes towards and acceptance of mobile advertising, using focus group interviews. Results indicate that British consumers generally do not accept mobile advertising. Although mobile adverts are seen as interesting, eye catching, and motivating consumers to browse. Consumers who accept the technology do not see the need to have adverts on their mobiles. Those who dislike this medium are comfortable with using the Internet through their PCs as they do not see the benefits of mobile advertising, due to its small screen and speed limitation. Managerial considerations are also discussed.

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Determinants of ERP Implementations: An Empirical Study in Spanish Companies..... 180

Javier de Andrés, University of Oviedo, Spain

Pedro Lorca, University of Oviedo, Spain

Jose Emilio Labra, University of Oviedo, Spain

This chapter aims to determine the factors influencing the decision of implementing an ERP system in a country where technology awareness and the technological development are not as high as those of some others. Firstly, the authors assume that adopters make rational choices but the authors also introduce an alternative innovation model based on the imitation perspective. A questionnaire was sent to the Spanish listed companies and the ERP; adopting firms were compared with a matched control group. The main results indicate that the only factors stemming from the rational-choice perspective, whose influence is relevant, are firm size and the ROI ratio. Also, the authors found that the introduction of the euro and the Y2K issue had an influence in the ERP decision. The influence of the sectoral adscription was supported partially. These findings evidence a certain influence of the imitation effect. The results of this chapter could eventually be extrapolated to the countries whose national culture is similar to that of Spain.

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Technology programs are a means to facilitate the development and commercialization process of new innovative technologies. They are forums for the exchange of information and for networking between companies and research institutes. The programs provide opportunities and financial support to carry out ambitious research and development projects and to build business expertise. The core of technol-

ogy programs are joint research projects between companies and research institutes. The objective of the study is to increase understanding of how such joint research projects within technology programs evolve in practice. The emphasis is on identifying factors that enhance the commercialization of new technologies and on finding barriers of commercialization. Based on the findings, practical recommendations are given on how the concept of technology programs can be further developed to utilize the unused potential in such programs.

Chapter XII

Technology-Related Privacy Concerns: An Emerging Challenge..... 208

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While Internet-based technologies have the potential to empower users immensely, individuals are becoming increasingly aware of the ways in which those technologies can be employed to monitor their computer-based interactions. In the past, much attention has focused on the impact of technology-related privacy concerns from a transactional perspective. However, privacy concerns regarding communication monitoring are now emerging as a significant issue with the potential to negatively impact both productivity and morale within the computer-mediated work environment. This chapter outlines the evolution of technology-related privacy concerns. The lack of definitional consensus and the resulting conceptual and operational confusion that surrounds the privacy construct is described. Furthermore, the significant deficit of rigorous academic studies on this topic is highlighted. The current state of privacy legislation in Europe is addressed and some of the key challenges that face researchers who may wish to conduct research on this phenomenon are outlined.

Chapter XIII

Fear of Flying and Virtual Environments: An Introductory Review 221

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Fear of flying is a common problem that many people have to face. As varied as the causes may be, all kinds of fears have many aspects in common. Much is known to us about fear, and the fields of psychology and psychiatry teach us that many times we can conquer fears simply by exposing the subject to the dreaded object. Human-Computer Interaction has branched even in this direction, including the treatment of phobias. With the help of Virtual Reality researchers around the world have recreated using a computer the way that psychologists and psychiatrists cure fears, adding a twist. Many times patients are supposed to go the extra mile and expose themselves, little by little, to what they are afraid of. Virtual Reality brings this type of exposure directly to the patient, with the comfort that such fear can be stopped at any time, since it is only a computer simulation. The most successful studies have been performed on arachnophobia, or the fear of spiders. There are also studies that deal with the fear of heights and the fear of public speaking. Some studies have also been performed on addressing the fear of flying using a virtual environment. This work is a review of such methods, and an explanation of the principles behind the motivation for these studies.

Chapter XIV

A Context-Based Approach for Supporting Knowledge Work with Semantic Portals..... 231

Thomas Hädrich, Martin-Luther-University Halle-Wittenberg, Germany

Torsten Priebe, University of Regensburg, Germany

Knowledge work can be characterized by a high degree of variety and exceptions, strong communication needs, weakly structured processes, networks and communities, and as requiring a high level of skill and expertise as well as a number of specific practices. Process-oriented knowledge management suggests to focus on enhancing efficiency of knowledge work in the context of business processes. Portals are an enabling technology for knowledge management by providing users with a consolidated, personalized interface that allows accessing various types of structured and unstructured information. However, the design of portals still needs concepts and frameworks to guide their alignment with the context of persons consigned with knowledge-intensive tasks. In this context the concept of knowledge stance is a promising starting point. This paper discusses how knowledge stances can be applied and detailed to model knowledge work and support to support it with semantic context-based portals. We present the results from implementing a portal prototype that deploys Semantic Web technologies to integrate various information sources and applications on a semantic level and discuss extensions to this portal for the support of knowledge stances.

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A Survey of Web Service Discovery Systems 254

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Web services form the core of e-business and hence, have experienced a rapid development in the past few years. This has led to a demand for a discovery mechanism for web services. Discovery is the most important task in the web service model because web services are useless if they cannot be discovered. A large number of web service discovery systems have been developed. Universal Description, Discovery and Integration (UDDI) is a typical mechanism that stores indexes to web services but it does not support semantics. Semantic web service discovery systems that have been developed include systems that support matching web services using the same ontology, systems that support matching web services using different ontologies, and systems that support limitations of UDDI. This paper presents a survey of web service discovery systems, focusing on systems that support semantics. The paper also elaborates on open issues relating to such discovery systems.

Chapter XVI

User Relevance Feedback in Semantic Information Retrieval 270

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The user dimension is a crucial component in the information retrieval process and for this reason it must be taken into account in planning and technique implementation in information retrieval systems. In this paper we present a technique based on relevance feedback to improve the accuracy in an ontol-

ogy based information retrieval system. Our proposed method combines the semantic information in a general knowledge base with statistical information using relevance feedback. Several experiments and results are presented using a test set constituted of Web pages.

Chapter XVII

A Preliminary Study toward Wireless Integration of Patient Information System..... 282

Abdul-Rahman Al-Ali, American University of Sharjah, UAE

Tarik Ozkul, American University of Sharjah, UAE

Taha Landolsi, American University of Sharjah, UAE

This paper presents the results of a study toward generating a wireless environment to provide real-time mobile accessibility to patient information system. A trial system is set up where database, internet, and wireless personal digital assistants (PDAs) are integrated in such a way that the medical professionals like physicians, nurses and lab assistants can create, access and update medical records using wireless PDAs from any location in the hospital which is covered by wireless LAN. The same services which can be carried out via fixed terminals with internet connectivity can be carried out using wireless PDAs. The implementation has used and integrated many technologies like Active Server Pages (ASP), Visual Basic®, Structured Query Language (SQL) Server, ActiveSync®, IEEE802.11 Wireless Local Area Network (WLAN) technology and wireless security concepts. The paper details the architectural aspects of technology integration and the methodology used for setting up the end-to-end system. The proposed architecture, its performance data and the common implementation barriers are reported.

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