Preface

ABOUT THE SUBJECT

For the last few decades, it is being recognized that enterprise computer-based solutions no longer consist of isolated or dispersedly developed and implemented MRP (Material Requirements Planning) and MRP II solutions, CRM (Customer Relationship Management) solutions, electronic commerce solutions, ERP (Enterprise Resources Planning) solutions, or others, transposing the functional/technological islands to the so-called ‘islands of information’. Solutions must be integrated, built on a single system, and supported by a common information infrastructure central to the organization, ensuring that information can be shared across all functional levels and management, so that users can see data entered anywhere in the system in real-time and, simultaneously, seamlessly allow the integration and coordination of most (if not all) the enterprise business processes.

The topic of Enterprise Information Systems (EIS) is gaining an increasingly relevant strategic impact on global business and the world economy, and organizations are undergoing hard investments (in cost and effort) in search of the rewarding benefits of efficiency and effectiveness that this range of solutions promise. As we all know, this is not an easy task! It is not only a matter of financial investment! It is much more, as this book shows. EIS are at same time responsible for tremendous gains in some companies and tremendous losses in others. So, their adoption should be carefully planned and managed.

Responsiveness, flexibility, agility and business alignment are requirements of competitiveness that enterprises search for. And we hope that the models, solutions, tools and case studies presented and discussed in this book can contribute to highlight new ways to identify opportunities and overtake trends and challenges of EIS selection, adoption and exploitation.

ORGANIZATION OF THE BOOK

This book integrates the enhanced versions of 22 papers selected from the international conference CENTERIS – Conference on ENTERprise Information Systems held in Viana do Castelo, Portugal, in October 2010. These selected contributions discuss the main issues, challenges, opportunities and developments related with Enterprise Information Systems from the social, managerial and organizational perspectives, in a very comprehensive way, and contribute to the dissemination of current achievements and practical solutions and applications in the field.

These 22 chapters are written by a group of more than 60 authors that includes many internationally renowned and experienced authors in the EIS field and a set of younger authors, showing a promising
potential for research and development. Contributions came from USA, Canada, Latin America, Africa and Europe. At the same time, the book integrates contributions from academe, research institutions and industry, representing a good and comprehensive representation of the state-of-the-art approaches and developments that address the several dimensions of this fast evolutionary thematic.

“Organizational Integration of Enterprise Systems and Resources: Advancements and Applications” integrates 22 chapters.

In chapter one, “An Enterprise Architecture Approach for Designing an Integrated Wood Supply Management System”, the authors propose an Enterprise Architecture methodological approach for designing an integrated modular Wood Supply Management System. Both Process Architecture Framework and Information Architecture were developed and used to define individual systems and integration requirements, discussed on the Applications Architecture. The Technological Architecture was further addressed. Results of its application to the Portuguese pulpwood, biomass and lumber-based supply chains are presented. Results show that this approach can effectively specify individual systems requirements driven from the processes descriptions built in collaboration with the agents. It further shows that a Service-Oriented Architecture can be derived, ensuring systems integration and interoperability.

“Governance, Sociotechnical Systems and Knowledge Society: Challenges and Reflections” presents some challenges and reflections about governance, knowledge society and sociotechnical systems. Based on the Action Network Theory, Theory of Constraints and others techniques, questions are pointed and discussed in a systematic and innovative way. Points like the synergism and collaborative ecosystem research efforts, knowledgeable organizations, and organizations as living beings, the involvement of people and others IT resources on the questions, and others are discussed considering questions, challenges and future perspectives. In conclusion, points are made to offer governance the normative goals of sustainability, existing socio-technical systems, and to imply connecting and synchronizing changes among the knowledge society actors.

Then authors of “In Search of a Star Trek Affective State” propose a postmodern evaluation matrix to reveal the structural biases and modernist conceptual ambiguities tied to the leader-worker dyadic in varying organizational contexts. The findings suggest that leadership researchers should consider complex behavioral decision-making processes that result in emergent group performances instead of focusing on a leader’s ephemeral behavioral traits. A postmodern approach also helps leadership researchers identify a group’s performance on a continuum that would demonstrate their willingness to act in a way that tests individual limits, stretches group boundaries, and exceeds company goals, what the authors term a Star Trek Affective State.

Web 2.0 and Enterprise 2.0 concepts offer a whole new set of collaborative tools that allow new approaches to market research, in order to explore continuously and ever fast-growing social and media environments. Simultaneously, the exponential growth of online Social Networks, along with a combination of computer-based tools, is contributing to the construction of new kinds of research communities, in which respondents interact with researchers as well as with each other. Furthermore, by studying the networks, researchers are able to manage multiple data sources - user-generated contents. The main purpose of this chapter “The Role of Social Networks in Distributed Informal Information Systems for Innovation” is to propose a new concept of Distributed Informal Information Systems for Innovation that arises from the interaction of the accumulated stock of knowledge emerging at the individual (micro) level. A descriptive study is to unveil and report when and how market research professionals use Social Networks for their work, creating, therefore, distributed information systems for Innovation.
The fifth chapter, “Adaptive Learning Cycle to improve the Competence-Building for Enterprise Systems in Higher Education” discusses the changes and challenges of enterprise systems in higher education and provide an overview about the learning theory and the actual learning supporting technology as a basis for the authors’ concept. Their approach considers actual needs of higher education, e.g. present learning in a lab as well as e-Learning courses supported by new methods in technology enhanced learning by recording student’s behavior to guide him through the system. Therefore the authors introduce an Adaptive Learning Cycle which considers tracking and analyzing results deduced with mining methods to improve the learning progress. The aim is to achieve positive influences on the progress of the learning process to build up professional competence.

Organizations not only play an increasingly active role in today’s society but also address every day’s necessities and concerns of individuals. To achieve competitive advantage, it is becoming more and more necessary that organizations perform efficiently in order to survive. As organizations can be defined as a group of people who work together to obtain common results, it is imperative that all its constituents represent themselves as part of the whole. Essential issues belonging to self-identity such as: who is the organization, what it does, for whom it operates and what its core values are can be answered by building a Business Model. In this context, the Business Model and artifacts like the Business Motivation Model, which help to specify the enterprise business architecture, can be complementary. Chapter six, “Organization Identity: the Business Model”, shows how the Portuguese Air Force developed its generic Business Model and describes two example of application in the strategic and operational levels.

Chapter seven, “The Use of Experts Panels in ERP Cost Estimation Research”, represents an effort towards illustrating the use of expert panels (EP) as a mean of eliciting knowledge from a group of enterprise resource planning (ERP) experts in an exploratory research. The development of a cost estimation model for ERP adoptions is very crucial for research and practice, and that was the main reason behind the willingness of experts to participate in this research. The use of EP was very beneficial as it involved various data collection and visualization techniques, as well as data validation and confirmation. Arguments for using EP over other group techniques are presented in this chapter. Experts modified and enhanced the initial cost drivers list and their sub-factors significantly, as they added, modified, merged and split different costs. Moreover, they ranked the cost drivers according to their weight on total costs. All of this helped the authors to better understand relationships among various cost factors.

Information management has assumed an increasing importance at business organizations, over the last decades. Such trends lead companies to promote enormous efforts on organizing and optimizing their business processes, acquiring expensive enterprise information systems, aiming to promote an accurate answer to market uncertainty. Unfortunately, traditional software implementations have revealed low levels of satisfaction by Enterprise Resource Planning (ERP) systems’ customers. The study presented in “Evaluating the Success of ERP Systems’ Implementation: A Study about Portugal” aims to evaluate the reasons for success and failure of ERP systems implemented at Portugal and the methodologies taken by consulting teams. To achieve such goal, it has been submitted a web survey to Portuguese companies and consulting teams, in order to confirm major errors, ERP systems’ coverage and quality’s response for business processes, and assessment of engineering requirements as a major concern. This study is concluded with the presentation of the web survey results and some conclusions about ERP systems’ implementation at Portugal.

Chapter nine, “Two Case Studies on RFID Initiatives: Testing the Impact of IT Infrastructure Integration and Supply Chain Process Integration”, features the results of an empirical online survey focusing on radio frequency identification initiatives and the revalidation of these results using brief case studies
on Charles Vogegele and Vail Resorts. The empirical study investigates the ability of information technology (IT) infrastructure integration and supply chain process integration to moderate the relationships between the importance of the perceived seven adoption attributes and system deployment outcomes, operational efficiency and market knowledge creation in radio frequency identification (RFID)-enabled supply chains. Using the online survey method, data was collected from members of the Council of Supply Chain Management Professionals in North America. The three adoption attributes, relative advantage, results, and image turned out to be the most important attributes in these RFID systems. Indeed, both IT infrastructure integration and supply chain process integration moderate the relationships between these three adoption attributes and the RFID system outcomes.

In order to be able to plan, execute, and control its activities to achieve the desired results, it is essential that organizations tie together the academic knowledge and the operational experience by utilizing proven scientific theories in the organization executables. There are several theories about how to frame the models of corporate governance according to different perspectives; there are advantages and disadvantages in the adoption of each of them. The more or less complete dimension when related to the scope of each model is also an important aspect in its use and disclosure. The EX-ANTE and EX-POST model proposes a set of concepts that allow for the co-existence of mechanisms of access control and registration and validation, being the governance of the system based on four architectures: strategic, business, applications and technology. The model that the Portuguese Air Force uses for the definition of its annual flying hours regime includes five well-defined phases that may improve the level of coverage if the listed security mechanisms, control and audit, recommended in the Model EX-ANTE and EX-POST, are considered in chapter tenth, “EX-ANTE and EX-POST Model applied to the Portuguese Air Force Flying Regime”.

The enterprise management (EM) approach provides a holistic view of organizations and their related information systems. In order to align information technology (IT) innovation with global markets and volatile virtualization, traditional firms are seeking to reconstruct their enterprise structures alongside repositioning strategy and establish new information system (IS) architectures to transform from single autonomous entities into more open enterprises supported by new Enterprise Resource Planning (ERP) systems. In “A New Dynamic Framework for Managing ERP Development and Enterprise Strategy”, authors see how ERP engage-abilities cater for three distinctive EM patterns and resultant strategies. The purpose is to examine the presumptions and importance of combining ERP and inter-firm relations relying on the virtual value chain concept. From a review of the literature on ERP development and enterprise strategy, exploratory inductive research studies in Zoomlion and Lanye have been conducted. In addition, the authors propose a dynamic conceptual framework to demonstrate the adoption and governance of ERP in the three enterprise management forms and points to a new architectural type (ERPIII) for operating in the virtual enterprise paradigm.

E-procurement systems make purchasing activities more effective in terms of both time and cost. However, over the past years there is evidence that some of the expected benefits have not been achieved. Among several causes, supplier’s low adherence to such platforms has been regarded as one. The focus of this work is in supplier adoption of e-Procurement. It will help to better address the issues actually faced by suppliers within e-Procurement. Authors have conducted a questionnaire-based survey to 721 Portuguese companies and performed an empirical analysis of the data. The findings from this work provide evidence that the supplier perceived indirect benefits and business partner pressures are most important to e-Procurement adoption while barriers have a negative impact on their adoption. The main critical success factors on e-Procurement adoption are also in the chapter “Electronic Procurement: The Supplier Perspective”.
Chapter 13 “End-user Attitude in ERP Post-Implementation: A Study in a Multinational Enterprise” analyzes the impact of the implementation of SAP R/3 in a Multinational Portuguese Organization (MPO), defining some Critical Success Factors (CSFs). In order to understand the motivations of end-users prior to implementation and to analyze the behavior after a change (post-implementation), a study based on a questionnaire was carried out. The sample included 67 users of SAP R/3 that were present throughout the process. Considering the results, we can conclude that the implementation of SAP R/3 in MPO was successful, and the respondents consider their work more productive and achieve easier access to information. The existence of a solid team to support the project was established as a major facilitator in the whole process, as opposed to the limited time and lack of training that emerged as barriers to the implementation. It was also found that the learning period assumes a high importance in the success of the implementation, since increasing the training time reduces the need for support to the end-users.

The relationship existing between a business process and the supporting software system is a critical concern for the organizations, as it directly affects their performance. The knowledge regarding this relationship plays an important role in the software evolution process, as it help to identify the software components involved by a software change request. The research described in “An Approach for Recovering the Connections between Business Process and Software System” concerns the use of information retrieval techniques in the software maintenance activities. In particular, the chapter addresses the problem of recovering traceability links between the entities of the business process model and components of the supporting software system. Therefore, an information retrieval approach is proposed based on two processing phases including syntactic and semantic analysis. The usefulness of the approach is discussed through a case study.

ERP systems have been introduced to support the efficient and effective execution of business processes. In practice, this may not fully succeed. This also holds in particular for inventory management (IM), which forms a part of supply chain management. Within this research, by analyzing the IM business process theoretically, eleven potential benefits are indicated. Next, by using a Business Intelligence approach, key performance indicators (KPIs) are selected to measure the performance of IM sub-processes. Integration of these approaches yields an IM performance decision support framework that can be used to obtain a generic, coherent picture of the fundamental IM processes in an organization. In addition, by tracking and analyzing KPI measurements, adequate decisions can be prepared towards the improvement of the operational IM performance. The framework proposed in chapter 15, “Inventory Management, a Decision Support Framework to Improve Operational Performance”, is validated using experts’ opinions and a comparative case study. The experts’ comments yielded a list of top-10 KPIs, based on the measurements of which a set of quick wins can be determined. The case study results show that some of the identified potential benefits are also observed in practice.

Traceability systems, including the approval and control of documents, are increasingly assuming a pivotal role in the workflow of information across an organization and they can be classified as an element of any internal control system at the organizational context which contributes for a continuous auditing and helps to manage and minimize organizational risk. RFID (Radio Frequency Identification) is a technology that can enable the development of architectures which provide an adequate response to this requirement of internal control. Thus, this chapter has as main objective to raise awareness of the importance of these systems in an organizational environment. Moreover this chapter “Automation of the Approval and Control Process of Documents” has the objective to propose a modular and flexible solution which simultaneously traces, monitors and searches the flow and location of documents in an organization, using RFID technology.
Collaborative workgroups have to make decisions, so it is necessary to have a good mechanism to obtain the better decisions, consensus decision-making helps organizations to that process based on a diagnosis and discussion approach of current, and idealized future scenario of a set of topics of interest. The model incorporates a mechanism that allows comparing the personal opinion to the average group’s opinion. Besides, it allows users to prioritize the topics evaluated, or agree about the potential risks in a specific field, with the aim of facilitate to take decisions about how and where to start actions. The model is presented within the dynamic context of an innovation community. A prototype of such consensus support system in which members provide their opinion in relation to some drivers that support and encourage their organization has been implemented. In such a way, we provide a new consensus framework which can be applied to support web-based consensus and decision processes in different environments. The chapter “Vector Consensus Model” presents two case studies: the first one is focused on the prioritization of the drivers that motivates researcher in an innovative group, the second is dedicated to the assessment of the drivers for future internet.

Public Administrations are each time more seeking for efficient alternatives in the use of information and communication technologies in terms of a cost-benefit analysis. Open source standards can offer them rational alternatives. Up to this moment the authors found some good experiences in the implementation of open source software in Public Administrations worldwide. The study presented in “Efficient Alternatives in the Adoption of Software for Public Companies” offers the results of a research where a group of eighteen Public Administration experiences of integral systems migration to open software standards have been analyzed. Public Administrations perceive improvements in the way they offer services, a reduction of the costs and better secured information systems.

Colombian healthcare industry has been growing since the late 90’s and the amount of spending allocated to this sector is the highest proportion of GDP in Latin American countries. Those facts have increased the importance of this sector for the economy and national development. Furthermore, enterprises with IT governance focus on organizational objectives have yielded superior results than their competitors. Authors of chapter 19, “IT Governance State of Art in the Colombian Health Sector Enterprises”, performed a research project to find out if there are similarities amongst Colombian Health Sector Enterprises that have obtained positive results. In this project, we studied IT governance, operational model, engagement model, and portfolio management of twelve companies, all of them large o medium-sized. Results show that IT governance behavior of Colombian healthcare industry is not homogeneous. Different subsectors have different behavior; some perform as large superior global enterprises and other are beginning their journey.

Cloud Computing is finding its way into the architecture of current IT landscapes. The present chapter depicts the challenges of the required changes and transitions of Enterprise Data Centers from non-integrated on-premise solutions towards fully integrated on-demand systems in silo-free clouds. Cloud standardization in the context of the Open Cloud Manifesto is discussed as well as a reference model basing upon semantic composition and federation (Federated ERP Systems and Corporate Environmental Information Management Systems CEMIS 2.0). Chapter 20, “Enterprise Tomography Driven Root-Cause-Analysis and Integration Lifecycle Management of Federated ERP in Green Clouds”, describes how Enterprise Tomography can support the governance process, the Root-Cause-Analysis procedure and Integration Lifecycle Management of an Enterprise Cloud by comparing different system states. On basis of an operator-based approach, Root-Cause-Analysis and data integrity can be ensured. Finally, an outlook on an approach involving environmental aspects (Green Clouds) is given.
IT Corporate governance is the information technology-governing discipline of corporate governance. Governing IT is not a simple discipline: researchers and practitioners have developed frameworks, best practices, etc. The standard ISO/IEC 38.500 sets the principles and activities to be carried in the organization to implement corporate governance of IT. Family owned enterprises introduces a specific particularity regarding governance: the family. Chapter 21, “Corporate Governance of IT in Spanish Family Owned Enterprises” presents an analysis of corporate governance of IT in family owned enterprises considering this singularity, from the Spanish perspective, and also it introduces two examples of implementation in family owned enterprises.

The new (e)commerce/(e)business paradigms forced enterprises to undertake important transformations and reorganizations. It happened with the web and will be repeated in the Cloud and social networks. The tourism is no more only a traditional commercial activity but ever more social and information-oriented. The tourism services need to be effective to be aligned with tourist requirements. The globalization and easy access allows tourists to change constantly their plans. Dynamic services reconfiguration and resulting impact on their information systems need to be supported. Chapter 22 explores new tourism services requirements as the ubiquity and dynamic reconfiguration, new brokering mechanisms and reliable integration processes, human-to-human synchronous collaboration to allow the natural involvement of the tourist on the co-creation of his activity plan with other agents (humans).

EXPECTATIONS

The book provides researchers, scholars, professionals with some of the most advanced research, solutions and discussions of Enterprise Information Systems design, implementation and management and is targeted to be read by academics (teachers, researchers and students of several graduate and postgraduate courses) and by professionals of Information Technology, IT managers, Information Resources managers, Enterprise managers (including top level managers), and also technology solutions developers.

We strongly hope it meets your expectations!

João Varajão  
University of Trás-os-Montes e Alto Douro, Portugal

Maria Manuela Cruz-Cunha  
Polytechnic Institute of Cavado and Ave, Portugal

António Trigo  
Polytechnic Institute of Coimbra, Portugal