

Preface

Enterprise information system(s) (EIS) such as the enterprise resource planning (ERP) and electronic commerce (EC) play a major role in the 21st century organizations. These systems will have a significant impact on organizational productivity and competitiveness in the increasingly global markets of the 21st century, and they warrant the attention of researchers. Globalization of markets and operations is closely related to the success of a company. This paradigm heightens the importance of sharing information and thus, the critical role of EIS in enhancing organizational effectiveness and competitiveness. ERP systems are the software tools used to manage enterprise data and provide information to those who need it, when they need it. These systems help organizations manage their supply chains: receiving, inventory management, customer order management, production planning and control, shipping, accounting, human resource management, and all other activities that take place in a modern business.

Global markets and competition have forced companies to operate in a physically distributed environment to take the advantage of benefits of strategic alliances between partnering firms. Earlier, information systems such as material requirements planning (MRP), computer-aided design (CAD), and computer-aided manufacturing (CAM) have widely been used for functional integration within an organization. With global operations are in place, there is a need for suitable enterprise information systems (EIS) such as enterprise resource planning (ERP) and e-commerce (EC) for the integration of extended enterprises along the supply chain with the objective of achieving flexibility and responsiveness. Companies all over the world spend billions of dollars in the design and implementation of EIS in particular

ERP systems such as Oracle, Peoplesoft, SAP, JD Edwards, and BAAN with the objective of achieving an integrated global supply chain. Inter-organizational information systems play a major role in improving communication and integration between partnering firms to achieve an integrated global supply chain. There is a growing demand for research and applications that will provide insights into issues, challenges, and solutions related to the successful applications and management aspects of EIS. *Modeling and Analysis of Enterprise Information Systems* provides researchers, scholars, professionals, and educators with the most current research on modeling and analysis of enterprise information systems. This volume presents new concepts in enterprise information systems.

Chapter I, “Implementation of Enterprise Resource Planning (ERP) Systems: Issues and Challenges”, by Subramanian and Hoffer reviews the literature on ERP implementation and presents the results of a case study on ERP implementation. Using the case study, the chapter indicates the presence of four phases in ERP implementation through the support from qualitative interviews. Using t-tests, the results confirm the presence of a positive feeling of users towards the four ERP implementation phases.

Chapter II, “Research Issues of the IT Productivity Paradox: Approaches, Limitations, and a Proposed Conceptual Framework”, by Law and Ngai proposed a research model to address the issues and problems of IT and its role in productivity. With expectation to mitigate the shortcomings of some of the prior studies, this model incorporates improvements in business process as an independent construct in parallel to the capabilities of IT and enterprise systems. Competitive capabilities are included as an intermediate construct to help conceptualize the linkage between the independent constructs and the dependent construct of organizational performance. Theories and empirical evidence are drawn from associated management disciplines such as operations management and from a resources-based view of the firm to illustrate and explain that investment in IT and business processes will eventually contribute to organizational performance through the creation and enhancement of competitive capabilities. Finally, the theoretical and managerial implications of this research model are highlighted.

Chapter III, “The Effects of Uncertainty on ERP-Controlled Manufacturing Supply Chains”, by Koh and Gunasekaran presents the developmental and experimental work on modelling uncertainty within an ERP multi-product, multi-level dependent demand manufacturing supply chain in a simulation model developed using ARENA/SIMAN. To enumerate how uncertainty affects the performance of an ERP-controlled manufacturing supply chain, the percentages of finished products delivered late and parts delivered late (PDL) are measured. Sensitivity analysis shows that PDL gives a more accurate effect. Simulations results are analysed using analysis of variance, which identifies four uncertainties namely late delivery from suppliers, machine breakdowns, unexpected/urgent changes to machine assignments, and customer design changes significantly affect PDL. Some uncertainties are found significantly

interactive in two and three-way. They produce either knock-on and/or compound effects, a factor not generally recognized as a criterion for decision-making.

Chapter IV, “Software Architecture and Requirements for a Web-Based Survey System”, by Baldwin and Chalasani briefly reviews literature regarding Web-based surveys and describes a software architecture for a Web-based survey system. The architecture for the survey system is based on three tiers comprised of a Web server, Web application server, and database server. The Web application server hosts the application modules that display and process the surveys. The application software consists of packages for establishing connections to the database and for reading static and dynamic data from the database. The processed surveys are written to the database with the survey responses. This system allows for anonymous survey responses and maintains user confidentiality. At the University of Wisconsin-Parkside, they have implemented this Web-based survey system, and used it to conduct three different surveys. This survey system is easily extensible to new surveys, and is used for instructional purposes to teach server-side programming. In this chapter, they discuss the key ideas behind the design and implementation of the extensible survey system, and provide results on its application.

Chapter V, “Identity Theft and E-Fraud Driving CRM Information Exchanges”, by Smith and Lias deals with an empirical study of 75 managerial employees and/or knowledge workers in five large organizations in Pittsburgh, PA, revealed a number of interesting concepts to find out how much information they share with others, what the likelihood is that they will conduct business online, and whether or not they take steps to protect their personal identity and credit. Model construction and implications were generated concerning steps that employees and customers may take to avoid identity theft.

Chapter VI, “Pricing Outcomes in Dual Channel Monopoly and Partial Duopoly”, by Sheikh, Amin, and Amin studies the pricing strategies first, of a monopolist selling a product through stores in two channels, but under single management (or coordinated management) and then propose a framework for a model for a partial duopoly market conditions. They find that the monopolist generally charges a higher price in the brick and mortar store than the price charged in the Internet store. If, however, there is a sufficiently large fraction of buyers who would strictly prefer to buy the product from the Internet store instead of the physical store at any given price, the monopolist might charge the same price in both the stores. They also find that physical store price of a dual-channel monopoly is higher than the physical store price of a single channel monopoly; the price charged in the Internet store is generally lower than the single channel monopoly price. The chapter concludes with an identification of parameters for channel pricing strategies under partial duopoly market conditions.

Chapter VII, “Enterprise Information Systems and B2B E-Commerce: Exchanging Secure Transactions Using XML”, by Baker reviews the objectives of using XML

in B2B e-commerce, reviews the technical structure of XML, and discusses ways that security and privacy can be enhanced while engaging in B2B e-commerce.

Chapter VIII, “Unleashing the Potential of SCM: The Adoption of ERP in Large Danish Enterprises”, by Møller argues that with the present state of enterprise resource planning (ERP) adoption by the companies, the potential benefits of supply chain management (SCM) and integration is about to be unleashed. This chapter presents the results and the implications of a survey on ERP adoption in the 500 largest Danish enterprises. The study is based on telephone interviews with ERP managers in 88.4% of the “top 500” enterprises in Denmark. Based on the survey, the chapter suggests the following four propositions: (1) ERP has become the pervasive infrastructure; (2) ERP has become a contemporary technology; (3) ERP adoption has matured; and (4) ERP adoption is converging toward a dominant design. Finally, the chapter discusses the general implications of the surveyed state of practice on the SCM research challenges. Consequently, the author argues that research needs to adjust its conceptions of the ERP concept towards ERP II in order to accommodate to the emerging practices.

Chapter IX, “Using Simulation to Evaluate Electronic Data Interchange”, by Truong identifies prescriptive and evaluative methodologies for analyzing investment in EDI: non-financial methods, purely financial methods, and financial and strategic consideration methods. The author also shows how computer simulation can be used as a tool for assessing EDI. Evaluating the benefits resulting from EDI implementation was illustrated through the well-known Beer Game. Their analysis and review also identifies difficulties involved in assessing the benefits of EDI in supply chains.

Chapter X, “Vertical Application Service Provision: An SME Perspective”, by Lockett and Brown discusses the importance of e-business in SMEs by conducting quantitative surveys of four aggregations of SMEs using these applications (users) and comparing these results with similar enterprises who are not (non-users) the research takes a deliberately SME perspective.

Chapter XI, “Planning and Designing an Enterprise-Wide Database System for E-Business”, by Yap presents a case study that involves a multi-national conglomerate that is in the process of integrating and Web-enabling their enterprise database systems. The objective of the system was to help engineers sift through millions of components offered by various suppliers and component manufacturers, where the end result was to improved the integration and efficiency of the product development, engineering design, e-sourcing, and e-procurement processes. This research is a qualitative action research study on how different organizational, social, political, and technical forces influenced the social construction of an enterprise-wide information system. Understanding the dynamics and power of these socio-technical forces in shaping the development environment and change process of enterprise systems is the focal point of this chapter’s discussion.

Chapter XII, “Toward Always-On Enterprise Information Systems”, by Bajgoric presents a framework for implementation of continuous computing technologies for improving business continuity. The framework is presented within a systemic view of developing an “always-on” enterprise information system.

Chapter XIII, “The Financial Appraisal Profile (FAP) Model for Evaluation of Enterprise-Wide Information Technology: A Case Example”, by Lefley and Sarkis argues that one of the important reasons for these failures is inappropriate project evaluation and selection. In order to reduce the level of project failures, they introduce an innovative methodology, the financial appraisal profile (FAP) model, which seeks to address some of the issues and limitations posed by standard appraisal and evaluation approaches for strategic technologies and programs. By making the right decision in the first place and involving senior managers in the appraisal process, the organization will be better placed to achieve project success. The adoption of a management team approach to investment appraisals will not only enhance the information base but will also result in greater managerial commitment to a project. They believe by adopting the FAP model greater awareness to strategic issues and goals will also be achieved, which should lead to a more focused top management team—with all members pulling in the same direction.

Chapter XIV, “An Investigation of the Existence of Levels of Enterprise Integration”, by Grant and Tu discusses six levels of enterprise integration and the ability of ERP to satisfy each of them. They analyzed six case studies that included IBM, Cisco, Tecktronic, Vandelay, China Holdings, and APD Manufacturing. They found evidence to support the existence of the six levels of integration. APD and China Holding did not exhibit evidence of global integration while the others did. System-user (level-II) integration was missing from all except APD. Islands-of-technology integration is no longer the dominant integration issue it was in the 80’s. The dominant integration issues are functional integration, customer relationship management, and supply chain management.

Chapter XV, “Analyzing Different Strategies to Enterprise System Adoption: Re-Engineering-Led vs. Quick Deployment”, by Newell, Coopridner, David, Edelman, and Logan explores how different strategies, such as the re-engineering of business processes up-front, employ a quick deployment on the assumption that organizational change plays out in practice and also consider the factors that influence which approach is taken. They use exploratory data from interviews with consultants from XYZ who have been involved in multiple ES implementations in external companies as well as interviews with project members involved in an internal ES implementation in XYZ. Analysis of the data suggests that some level of re-engineering is an inevitable outcome of ES implementation. However, attempts to re-engineer up-front is difficult and can be problematic. Much of this stems from how the ES is actually used versus its envisioned (or planned) use. The implications for post-implementation exploitation opportunities are explored.

Enterprise information systems have become a key component of 21st century organizations. It is hard to imagine an integrated supply chain without the application of ERP systems. Effective management of ERP will make a great difference in organizational performance and competitiveness. Nevertheless, design, development, and implementation of ERP become a necessary goal for all, and this may be accomplished by learning from the research and advances of others with ERP systems. An outstanding collection of the latest research associated with the effective development and implementation of ERP systems, *Modeling and Analysis of Enterprise Information Systems*, Volume I of the *Advances in Enterprise Information Systems Series*, provides insight and assistance in learning how to successfully implement ERP systems in companies.

My sincere thanks go to all the authors in this edited book whose timely submissions and revisions of chapters have made this book possible. I am thankful to Mehdi Khosrow-Pour, president of IGI Global, and Kristin Roth, development editor, for their constant support throughout editing the book.

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Editor-in-Chief

Modeling and Analysis of Enterprise Information Systems

Volume I, Advances in Enterprise Information Systems Series