

## Preface

Enterprise resource planning systems (ERP) are currently one of the most, if not the most complex information systems for businesses. Consequently, they are also the most expensive piece of the organizational IT/IS puzzle. Their complexity derives from the myriad of requirements that they must satisfy at the same time. And the number of requirements increases considerably when the systems have a global coverage. The costs of these systems are the licensing fees (which are not always high and in some cases are even null) plus all the implementation costs (which go from training to changing standard operating procedures). The chapters in this book look into the costs and benefits (not only from a financial point of view) derived from successfully implementing a global ERP. Each chapter looks at a different and very relevant aspect of the ERP adoption and implementation process.

In today's global village, adequate information systems are a business requirement. They are very clearly needed by large organizations that manufacture, process, distribute, and deliver items worldwide. But they are also critical for small and medium-sized companies that are inevitably part of a larger global supply chain. Both transaction and internal costs are reduced by the use of effective information systems. But individual information systems that only satisfy the needs of a given department or function easily become islands that impede the necessary flow of information. Nonetheless, each of these individual systems have by themselves a very extensive set of demands that becomes quite complex when we try to integrate them together into a single system that satisfies not only the needs of the individual departments but of the entire organization or the entire supply chain. Never before had we developed such complex and large systems. Even the most critical systems developed to fly a rocket ship or to simulate the behavior of a nuclear reactor are much smaller and do not have as many interrelated parts; therefore they have less complexity than today's global ERPs.

Furthermore, implementing these systems is not only a technical matter. Even if we had a perfect, bug-less piece of software, the implementation of an ERP requires extensive training and organizational change to be successful. Each organization is different and it has its own peculiarities that will affect not only the process but the final outcome. A successful ERP is more than a machine running a piece of software; it is the sum of the technology, its people, and the organizational procedures.

ERPs have been around for more than a decade. They not only have already developed their history but have also inherited the history of the systems that came before them. The first chapter of this book "From Ledgers to Global ERP" recalls this history and with it, it describes not only its evolution but also the functionality included in them. It describes how ERPs have integrated the functionality of its predecessors, like material requirement planning (MRP) and accounting information systems (AISs), and also added novel functionality that satisfies new organizational needs like supply chain management (SCM) and customer relationship management (CRM). And these new needs keep on growing, particularly when we consider that many organizations have a global scope. The chapter titled "Enterprise Resource Planning Systems in a Global Environment" adopts a case study research approach to discuss how a company used an ERP system to support its global transformation, the issues associated with corporate strategy,

and how information systems can underpin the achievement of corporate goals. The decision to implement a global ERP is part of a strategy, and the ERP itself becomes part of the organizational structure. In the chapter titled “A Conceptual Framework for Developing and Evaluating ERP Implementation Strategies in Multinational Organizations,” the authors show that while an extensive literature exists in regard to the management of multinational organizations, the aspect of ERP implementations in such a multinational context has not yet been sufficiently addressed, and thus a framework for multi-site ERP implementations contingent on the general business strategy of a company is developed.

Contrary to what is generally said, the elimination of licensing costs through an open source license does not reduce substantially the total cost of successfully implementing an ERP. The savings in licensing generally come at the expense of higher implementation costs. The chapter titled “Enterprise Resource Planning Under Open Source Software” provides a review of real options theory literature in examining factors that go into determining whether an open source enterprise resource planning (OS-ERP) package is a valuable option for a corporation. The high consulting and service costs associated with an ERP, particularly those with a global scope, are partly due to the complexity in the software, but are also due to the large variety of aspects that are involved in accomplishing a successful implementation. In “Achieving Business Benefits from ERP Systems,” the author shows how organizations around the world are very interested in evaluating the short- and long-term benefits of investing in the implementation of these increasingly expensive systems.

Organizational resistance to adopt new technologies, procedures, and systems is ever present in the implementation of ERPs. To cope with this resistance, there is a discipline called “change management” that is now included in the curriculum of most MBA programs. The chapter titled “The Secret Success of a Global ERP Champion: Everything Changed and Nothing Happened” explains the role of a global ERP champion in guiding a business through process transformation and ERP system implementation. This chapter also has a very interesting and surprising discussion on what can be expected when we pass the switch in a new implementation.

Process reengineering is a discipline that helps determine and plan the changes needed in an organization. Some consultants recommend the obliteration of all existing processes and the development of completely new ones; others are more conservative and suggest making small but successive changes. As mentioned earlier, change is always difficult; and the more dramatic the change, the more difficult it is, particularly when there is nothing on which to mold the new organization. Therefore many organizations rely on the implementation of an ERP to succeed in their reengineering process. The chapter titled “Business Process Reengineering and ERP: Weapons for the Global Organization” provides a current perspective on business process reengineering as it relates to ERP, while critically discussing past research in the field.

ERPs are frequently presented as very rigid systems that have little or no flexibility at all. Many times it is argued that it is the organization, not the ERP, that needs to change for the implementation to be successful. The chapter titled “Enterprise Systems as an Enabler of Fast-Paced Change: The Case of Global B2B Procurement in Ericsson” questions this assertion by using a case study. The chapter shows that ERPs can also be flexible tools in terms of being able to reconfigure and adapt themselves correctly to organizational changes. A de facto answer to the alleged rigidity of ERP has been the development of information systems by employees in addition to or outside the implemented ERP. To explain this phenomenon, the concept of “feral systems” is introduced in “Feral Systems and Other Factors Influencing the Success of Global ERP Implementations.”

Cultural aspects among global ERP users have become a major issue in the successful implementation of these systems. The chapter titled “Experiences of Cultures in Global ERP Implementation” considers the complexities of cultural differences for global enterprise resource planning implementation, and the chapter titled “The Implementation of ERP Packages as a Mediation Process: The Case

of Five Brazilian Projects” investigates the implementation of ERP as a mediation process—that is, an interactive process developed between the organization’s members and external consultants. However, the set of cultural differences between ERP users are just one of many challenges faced by managers of multinational or global projects.

Two chapters discuss the changes needed to adapt ERPs to the new regional and international audit standards (i.e., the well-known Sarbanes-Oxley Act (SOX) in the United States) that have risen since the fraudulent demise of several well-known enterprises a few years ago. The chapter titled “Sarbanes-Oxley Compliance, Internal Control, and ERP Systems: The Case of mySAP ERP” tackles some of the managerial issues inherent in addressing SOX compliance in ERP systems. “ERP Systems Effectiveness in Implementing Internal Controls in Global Organizations” reports the results of interviews with ERP systems managers and directors in four organizations with significant global operations regarding the implementation of new internal controls through the use of ERP.

We are still far from understanding what makes a global implementation successful. There are many factors involved and too few studies that allow a better understanding of these factors. The chapter titled “Implementing ERP Systems in Multinational Projects: Implications for Cultural Aspects and the Implementation Process” presents—with a detailed analysis of the validity—three surveys performed in Germany, the United States, and Turkey on the success factors of ERP implementation projects. It also includes an evaluation of common lifecycle models for implementing ERP software systems and a new lifecycle model based on the author’s findings. The new and until-not-long-ago unsuspected dimensions of global ERP implementation projects have forced managers to rethink how to measure success and which are the factors that cause it. After showing that there are few field studies on global enterprise resource planning implementations, the chapter titled “Success Factors for the Global Implementation of ERP/HRMS Software” presents a field study for a global implementation of enterprise resource planning software. It focuses on the experience of one company in a global implementation, with particular focus on cultural differences, management support, resistance to change, trust, and communication-distance. It finds, among other results, that while the software implementation overall was considered successful, the non-U.S.-based locations perceived that their existing processes did not improve with the ERP implementation.

Cultural differences tend to show their strongest expression in the laws and regulations of each market. The chapter titled “ERP Trends, Opportunities, and Challenges: A Focus on the Gulf Region in the Middle East” highlights the key trends in the ERP market, with a special focus on the challenges related to the implementation of these systems in the Middle Eastern Gulf region. It identifies key opportunities, challenges, and issues pertaining to ERP implementation in the region.

ERPs have gone further than their predecessors (material resource planning systems and accounting information systems, among others) and integrate into a single system the control and balance of almost all the organizational resources. This was one of the main challenges that ERPs were meant to solve from their beginnings. However, ERPs are still far from being accessible by many companies worldwide, particularly small and medium-sized companies. For these companies, the cost of an ERP—particularly the implementation cost—is too high, their implementation times too long, and their dependency on outside consultants too difficult to manage. In addition, the planning capability, inherent to ERPs and critical for large enterprises—which are still the main market for ERPs—is of very little use to them and in fact is in many cases an obstacle. Furthermore, current ERPs lack standards for interaction and exchange of information, making most systems incompatible. When the entire supply chain uses the same ERP, the interaction is viable, but when each company uses a different ERP then each company is isolated from the rest. However, while large organizations may purchase or develop middleware that facilitates this communication, SMEs cannot afford them and become islands inside this critical river of information. The chapter titled “The Future of ERP and Enterprise Resource Management Systems” discusses these

challenges and foresees some avenues to confront them by proposing enterprise resource management (ERM) systems as a potential solution. This last chapter also raises questions on the future of the ERP market and on the role that Microsoft (today's 800-pound gorilla) could play in it.

The set of chapters that constitute this book provides an important and critical overview of the complex world of global ERPs. The reader will be able to truly understand what is meant by a global ERP, how to value it, what benefits can and cannot be expected from them, how long it takes to implement them, and what many of the risks involved are. The reader will also learn about the main internal and external factors that negatively and positively affect their implementation, which are the previous relevant experiences and how can they be managed. Finally, the reader will have acquired an idea of what can be expected of these systems and this industry in the near future.

Each chapter included in this book has been rigorously selected and improved through at least two rounds of a double-blind peer review process. Part of the selection criteria used was the extent to which the global aspect was discussed, its novelty, and its usefulness to both practitioners and academics. The arguments presented are supported by prior literature, analytical reasoning, and data (whenever applicable). Each chapter also offers a selection of additional readings that allows the reader to delve further into each topic.

The book is divided into seven parts that classify the chapters into different aspects that are relevant to global ERPs. The following sections present the academic and managerial relevance statements developed by the individual authors for each chapter.

## **SECTION I: RISE AND GLOBALIZATION OF ERPS**

### **Chapter I. From Ledgers to ERP**

#### **Academic Relevance Statement**

The history of the accounting needs and their successive technological solutions—which today is the ERP system—are examined using as many references to the relevant literature as possible. The ledger, double-entry accounting, cost accounting, departmental accounting, material requisitions systems for production, human resources systems, and finally the enterprise-wide resource planning or management systems are analyzed in terms of how IT has—and has not—been able to “computerize” and integrate them effectively, particularly throughout the last two decades. The main functionalities of ERPs are studied: the enterprise resource functionality and the planning functionality. Then, the expectations that have not yet been satisfactorily fulfilled by current systems are also analyzed: the ERP for the global organizations and the ERP for SMEs. The high implementation costs, the problem of interconnecting the ERPs, and the problems of transferring the “best practices” are discussed from a conceptual point of view.

#### **Management Relevance Statement**

After reading this chapter the manager will know—well beyond commercially biased arguments—what ERPs are and what organizations can expect from the current systems. Is ERP just a fashionable accounting system? Is it more than a MRP II system? The chapter shows how ERPs integrate these and other business-oriented systems. It also explains in detail the resource and the planning functionalities of an ERP, and discusses the extent to which organizations really need these functionalities and the “best practices” incorporated in them. It analyzes the current cost factors of an ERP and their tight rela-

tion with the intrinsic complexity and therefore intrinsic cost of developing an implementing and ERP. What is a global ERP? Are they meant for global organizations or for every organization of the globe? This theme is discussed from different points of view, assessing that even if global ERPs were meant for global organizations, they will need to interact with other, eventually local ERPs, which implies the globalization of at least the interaction subsystems.

## **Chapter II. Enterprise Resource Planning Systems in a Global Environment**

### **Academic Relevance Statement**

Extensive research has been documented in regards to the implementation and use of ERP systems. However, much of this research focuses on a single implementation in one country. The research that has been carried out on global implementations has been limited. This chapter adopts a case study research approach to discuss how a company used an ERP system to support its global transformation. The case study provides a foundation for researchers to further investigate global implementations and the role ERP systems play.

### **Management Relevance Statement**

ERP systems are an essential information technological infrastructure for many of the world's leading companies. They are now considered a mechanism to assist with corporate transformation, especially for companies operating in a global environment. This chapter discusses the issues associated with corporate strategy and how information systems can underpin the achievement of corporate goals. It discusses how one company used an ERP system to assist in its transformation of its global operations.

## **Chapter III. A Conceptual Framework for Developing and Evaluating ERP Implementation Strategies in Multinational Organizations**

### **Academic Relevance Statement**

This chapter adds an important perspective on the implementation process of ERP systems in a multinational context to the literature. While an extensive literature exists with regard to management in multinational organizations, the aspect of ERP implementations in a multinational context has not yet been sufficiently addressed. The critical success factor literature rarely deals with the existence of a global ERP and implementation strategy, and its influence on the implementation process. In order to address this shortcoming, the chapter develops the concept of a global ERP strategy and derives generic implementation approaches.

### **Management Relevance Statement**

In this chapter the authors develop a framework for multi-site ERP implementations contingent on the general business strategy of a company. The critical success factor literature demonstrates that the reasons for failures and delays in implementation processes often lie in a disregard for the strategy component and the alignment between business and information technology. This chapter will help to develop an ERP implementation strategy and to identify the appropriate implementation approach for multi-site ERP implementation projects based on the company's overall business strategy.

## **SECTION II: INVESTMENT ASPECTS**

### **Chapter IV. Enterprise Resource Planning Under Open Source Software**

#### **Academic Relevance Statement**

This chapter provides a review of real options theory literature in examining factors that go into determining whether an open source enterprise resource planning package is a valuable option for a corporation. Building upon current real options valuation criteria, three new criteria are discussed as particularly relevant in the OS-ERP context: customization, quality of the source code, and business model of the open source software vendor. These factors—in addition to current factors relevant to platform decisions, like susceptibility to network externalities and prospects for network dominance—provide a solid basis for valuing OS-ERP options. Academics interested in real options theory, valuing IT platforms, ERP systems, and open source applications will find this chapter useful.

#### **Management Relevance Statement**

This chapter starts with an overview of open source technologies and quickly builds to provide an assessment of the current enterprise resource planning offerings available as open source software. Then, it provides criteria for managers or executives to use to determine whether an open source ERP package is right for their organization. These criteria will prove valuable to managers assessing any open source application, and in particular OS-ERP applications. Although OS-ERP offerings are relatively immature as compared to other ERP offerings, there is a definite global focus, as is discussed in this chapter. The chapter will prove useful as a primer in OS-ERP applications and useful to key stakeholders familiar with these applications looking to make the right decision for their organization.

### **Chapter V. Achieving Business Benefits from ERP Systems**

#### **Academic Relevance Statement**

This chapter discusses the tangible and intangible benefits of enterprise systems implementation in organizations globally. The chapter will motivate students and academics to assess the benefits in different organizations all over the world and compare the results. It will also be interesting to know why organizations should adopt enterprise systems globally to accomplish maximum benefits in terms of efficient operations and productivity. With the growing proliferation of ERP systems, including midsize companies, it becomes critical to address why and under what circumstances one can realize the benefits of an ERP system. ERP systems can provide the organization with competitive advantage through improved business performance by, among other things, integrating supply-chain management, receiving, inventory management, customer orders management, production planning and managing, shipping, accounting, human resource management, and all other activities that take place in a modern business.

#### **Management Relevance Statement**

This chapter discusses the benefits that organizations may accomplish from their investment in implementing enterprise systems. ERP system investments are strategic in nature, with the key goal often being to help a company grow in sales, reduce production lead time, and improve customer service benefits

(tangible and intangible). It is important for managers to understand business benefits comprehensively in order to justify the acquisition and implementation of ERP systems in organizations globally. In the present context of globalization, mergers, and acquisitions, it is more significant to know this so that it can be applied in an optimized way to get the return from enterprise system implementation. These benefits have reportedly been acquired through enterprise implementation. This may also be helpful in constructing enterprise system roadmaps in organizations.

### **SECTION III: ORGANIZATIONAL ASPECTS**

#### **Chapter VI. The Secret Success of a Global ERP Champion: Everything Changed and Nothing Happened**

##### **Academic Relevance Statement**

The role of the champion in a global ERP implementation and business process change effort is framed within a conceptual model borrowed from a classic work on how people cope with traumatic life changes. This approach to change management seems to resonate with practitioners, as some similar frameworks have appeared in various consultant and trade publications. The application of this framework in the present case analysis offers interdisciplinary insight for theory development and applied research. In particular, the model described here anticipates a decline in business process performance when a large-scale change is rolled out in a global organization. The model includes three specific efforts that a champion can initiate to move a business out of the anticipated period of decline. With regard to global ERP implementation, this chapter also encourages applied research that considers some alternative definitions of success and “value realization” associated with globally integrated information technology change. For example, rather than expect outcomes such as return on investment when a new ERP system “goes live,” framing the introduction of new technology in a larger change context suggests alternative outcomes that underscore a successful implementation and integrated business processes. Finally, the present chapter emphasizes the importance of the “people component” when a new system is introduced in a multi-cultural organization and offers some suggestions for studying the role and behaviors of effective change champions.

##### **Management Relevance Statement**

The successful implementation of an enterprise resource planning system on a global scale depends upon champions who must be prepared to guide everyone involved in the project through this change. But how does a champion of change prepare to lead an effort that uproots legacy systems and established regional business processes in favor of a globally integrated system and a new set of procedures? Global ERP champions need to develop a sense of what to expect—and what not to expect—regarding the implementation of a global ERP system and the business process changes required, and they need to be able to communicate these expectations to business leaders and managers involved in and ultimately affected by the project. In an effort to prepare managers and change leaders as they embark on a global systems integration and change effort, the following chapter provides a guiding framework developed from the first-hand experience of a successful global ERP champion.

## Chapter VII. Business Process Reengineering and ERP: Weapons for the Global Organization

### Academic Relevance Statement

This chapter provides a current perspective on business process reengineering as it relates to ERP, while critically discussing past research in the field. Research on reengineering has, for the most part, disappeared over the last few years. This chapter renews interest in the subject from a research perspective, by stating that reengineering in organizations has not stopped. Many organizations are still reengineering, clean-slate or with ERP, and the lessons learned are invaluable. While large-scale studies of reengineering still have not taken place, this chapter seeks to renew interest in the subject matter while enlightening readers of the possibilities of future research endeavors.

### Management Relevance Statement

Alexander Graham Bell said, “Knowledge is a process of piling up facts. Wisdom lies in their simplification.” This chapter aims to increase your knowledge of business process re-engineering and how it can go hand in hand with enterprise resource planning systems. By simplifying the drivers of these disciplines and adding real-world insights, we aim to share our wisdom so that the reader may adopt, adapt, and implement successful change in a timely manner. The ideas, advice, and lessons learned will be invaluable for any manager, director, or project leader tasked with improving profitability, reliability, and customer satisfaction. This is not the “painting by numbers” or “reengineering for dummies” approach. It is a collection of insights learned in the battlefield that ultimately impact success. Many will seem like “common sense”; others will stretch your imagination and test your understanding of what really causes outcomes. Whatever you attempt to reengineer, our experience suggests you could achieve upwards of a 30% reduction in cost. Marry that with the change in philosophy you will bring to your organization, and you have a powerful approach that enables you to embrace the future with confidence.

## Chapter VIII. Enterprise Systems as an Enabler of Fast-Paced Change: The Case of B2B Procurement in Ericsson

### Academic Relevance Statement

Enterprise systems (ESs) flexibility is considered a key priority in business environments. Some have argued that ESs are too inflexible. There are criticisms of two specific issues. The deployment cycle for an ES is too long. It could take several years. On the other hand, an ES does not permit full customization to meet specific business needs, and mutual adaptation between the organization and the system is required. However, as has been argued, in response to this inflexibility claim, we would ask managers and scholars, “As compared to what?” The answer to this question leads us to the conclusion that an ES is one of the more flexible information tools for companies. Of course, there is room for improvement as evidenced by new advances. For example, service-oriented architecture emerges as an evolution of ES that allows companies to have more enterprise system flexibility to respond more quickly to changes driven by the business environment.

This debate has also been relevant in information system literature, which includes development of a flexibility construct for IT architectures. In particular, this study of Ericsson has borrowed that flexibility construct to illustrate how SAP can be considered a flexible information tool for companies. The result

is a chapter that makes a contribution to this debate and brings interesting knowledge to the field. The study adopts a stance similar to that of past researchers and presents ES as a flexible infrastructure to enable change. In particular, this study shows how SAP can support fast-paced change in a global context. The system was able to adapt to different business models going through different levels of change over time: from a local context (i.e., the Spanish solution) to a regional context (i.e., the European solution) to a global environment (i.e., the centralized solution for the global company). Having only one system worldwide was critical when it came to responding effectively to business changes. But it was not just any kind of system: SAP offered the three critical components of a flexible platform (i.e. integration, modularity, and personnel).

### Management Relevance Statement

The findings of this investigation have important implications for practitioners. The study shows that enterprise systems (e.g., SAP) can be flexible tools in terms of being able to reconfigure and adapt themselves correctly to organizational changes. In this specific case, Ericsson developed three major transformations in its procurement processes, and the system was able to adapt and align itself to three different business models over a transformation period of four years. First, the system followed a local and decentralized procurement process; then the system was reconfigured to support a regional “shared service” for procurement; and finally the system was adapted to enable a global and centralized procurement process led by the head office in Sweden. When talking about these findings with dozens of managers in different executive education programs, they all acknowledge that in this kind of fast-paced change, a packaged system like SAP is the best technological option with which to tackle organizational change. Compared to custom-made software, packaged systems are better able to respond quickly and flexibly to changes in business strategies and models. Two questions remain, however: Will it be possible to reconfigure and adapt the system faster? And what further organizational and technological capabilities are needed?

A second implication for managers is that they learn that implementing a single system vendor for all functions and processes in a company can bring positive net benefits. In this case, Ericsson decided to implement the B2B procurement functionality of the ERP system already in place. The decision to keep the same vendor allowed the company to take advantage of the integrated and modular characteristics of a single system, and hence adapt it quickly to the required organizational changes. Moreover, selecting the same leading ES vendor afforded companywide previous knowledge of the system, and worldwide support from external consultant IBM. In other words, when a company selects a software vendor, it should take into account if the knowledge it has of the system is localized or companywide. Another key factor is the ability of the vendor to supply external technical resources worldwide. This case shows that the selection of a single, leading vendor is a good decision for a global company immersed in a dynamic business environment.

## Chapter IX. Feral Systems and Other Factors Influencing the Success of Global ERP Implementations

### Academic Relevance Statement

This chapter is relevant to academic research and teaching because it provides summary information on research undertaken in the 12 enterprise resource planning systems implementation problem areas as identified by ERP consultants (Rockford Consulting). These problem areas have the potential to

provide a useful division of the ERP implementation problem domain in terms of areas that could be studied by researchers around the world. The chapter provides an initial literature review of some of the background research and a summary of research findings in the 12 research areas that an academic may wish to pursue. The chapter also introduces the concept of feral systems, which are described as information systems that are developed by individuals or groups to help them with their work, but are not condoned by management or are not part of the accepted information systems for the corporation. Continued research into the positive and/or negative aspects of these feral systems is vital for a clearer understanding of their role in organizations, and academics are encouraged to continue research in this area. The author's current research indicates that there is a dichotomy of opinion in the study corporation he was involved with. This dichotomy is highlighted with employees at the operations level of the corporation indicating positive aspects to feral systems—these include more comprehensive reporting and easier data entry into the ERP—while others, notably senior managers and information professionals, express concern over information technology integration and maintenance issues.

### Management Relevance Statement

This chapter provides practical solutions to global enterprise resource planning systems implementation problems for managers. It gives the reader a checklist of 12 factors that influence the effective implementation and subsequent adaptation of global ERPs. It also provides practical examples of common implementation problems and a brief history of ERP failures. The chapter provides a generic step-by-step guide to implementation success, as well as the suggested approach as outlined by a major ERP vendor, namely, SAP. The chapter covers both the well-documented practical problems of a lack of top management support, lack of staff training, poor communications, inadequate allocation of resources, and poor project management approaches, as well as the not-so-well-reported problems of employee resistance to change. The chapter introduces a new concept of feral systems, which are described as information systems that are developed by individuals or groups to help them with their work, but are not condoned by management or are not part of the accepted information systems for the corporation. The development of these systems appears to stem from a mistrust of the system and poor employee training, as well as the desire for employees to stick with their own legacy systems. The author cannot conclude whether feral systems are a negative or positive within an organization, because research in this area indicates that some employees consider that these systems inform the ERP and provide useful summary reports, while others consider them to be a problem with respect to information systems integration and maintenance.

## **SECTION IV: CULTURAL ASPECTS**

### Chapter X. Experiences of Cultures in Global ERP Implementation

#### Academic Relevance Statement

Despite agreement among IT investigators on viewing cultural sensitivity as a key issue in global IT implementation, global research on the impact of societal and cultural differences on IT implementation is difficult and scarce. As a result, it is proposed to integrate two bodies of research findings: the findings related to differences in various aspects of societal cultures, and the findings related to typical stages and processes of enterprise resource planning implementation. Instead of Hofstede's study, the

most frequently used work in current research efforts on cultural differences in global ERP implementation, use is suggested of the GLOBE findings which extend Hofstede's work and overcome most of its methodological deficiencies. Applying these recent research findings to global ERP implementation stages and actors will contribute to our understanding of the social construction of technology in different parts of the world. Additional research on proposed mechanisms that promote fit between local societal culture and cultural aspects embedded in ERP systems is suggested.

### Management Relevance Statement

The routine operation and exploitation of a global enterprise resource planning system in a particular organization is the last stop in a long journey that typically begins in a different country or region. Designers and engineers that plan and manufacture technological systems imprint their values and practices onto these systems, without fully realizing that inconsistencies in cultural dimensions between developers and users may result in poor implementation of the new system due to resistance to change, among other causes. Therefore, managers' awareness of cultural differences is a necessary condition in formulating ERP policies for implementation in different organizational settings across countries. The chapter offers detailed examples of cultural differences between countries and their relations to the different stages of technology implementation, which may serve as a guideline for engineers, vendors, consultants, and managers of global ERP systems interventions in formulating mechanisms for global implementation. Implementation managers are advised to adapt ERP systems to their own set of beliefs through the establishment of joint global and local teams that represent all parties in the process. In this manner, rather than a cultural conflict, ERP implementation becomes a cultural exchange that reduces resistance to change.

## Chapter XI. The Implementation of ERP Packages as a Mediation Process: The Case of Five Brazilian Projects

### Academic Relevance Statement

This research has investigated the implementation of ERP projects as a mediation process—that is, an interactive process developed between the organization-client's members and the external consultants. The adoption of a mediation lens sharpens perception of ways in which global and local knowledge and skills have been combined in different ERP projects, and how these different arrangements have affected the project results. Brazilian subsidiaries of global (transnational) firms were investigated with a view to analyzing the process of ERP implementation, its interdependence with national and organizational contexts, and the dynamics of interaction among groups during implementation. Underlying our analysis were two main questions: (1) How do patterns of mediation emerge, and what kinds of elements influence their emergence? (2) What kind of association can be established between patterns of mediation and project results? Our conclusions point to certain drivers for patterns of mediation. The local firm's position (status and relationship) regarding the head office (global firm) and the meaning attached to each project directly influence the way external consultants are perceived by the local firm's members, and these perceptions influence team members' and consultants' roles. In turn, the way these roles are performed contribute to reinforcement or transformation of established mediation patterns.

## Management Relevance Statement

The elements discussed in this chapter hold lessons for managers in both global and local firms. Our research addresses the critical choices managers and executives are likely to be faced with when implementing ERP projects within the framework of global or transnational companies. Certain recognizable patterns are identified based on the recurrent nature of problems and solutions associated with the same technology. Our investigation focuses on patterns in the relationship between clients and consultants, in the context of a global firm's decision to implement ERP packages in its subsidiaries. These patterns are then related to the project results. Important note is taken of the fact that patterns of mediation are dynamic processes that can change over time. Thus, understanding how patterns of mediation work and evolve lays the groundwork for developing better policies and methods of ERP implementation. What is provided here is not a fixed recipe, but an assemblage of insightful concepts that provide a basis for better decision making.

## SECTION V: AUDITING ASPECTS

### Chapter XII. Sarbanes–Oxley Compliance, Internal Control, and ERP Systems: The Case of mySAP ERP

#### Academic Relevance Statement

Compliance management is becoming a management function in national and international companies. Academics need to understand the tasks involved, the processes employed, and the effects on performance and organization, for example. This chapter addresses how compliance with a specific legislation is supported by an ERP system by examining the functionalities of this system. It also raises some further research issues in this area.

#### Management Relevance Statement

Compliance with laws and regulations demands more management attention today than ever before. Understanding how ERP systems can support and improve compliance performance on a local, regional, and global level is therefore a relevant managerial issue. This chapter addresses some of the managerial issues inherent in addressing SOX compliance in ERP systems.

### Chapter XIII. ERP Systems Effectiveness in Implementing Internal Controls in Global Organizations

#### Academic Relevance Statement

The internal control requirements imposed by the Sarbanes-Oxley Act, commonly referred to as SOX, over financial reporting can result in significant design challenges for ERP systems in most public organizations. However, little theoretical guidance or models exist to help researchers understand control implementation challenges and enhance ERP systems for control purposes in competitive global organi-

zations. This chapter reports the results of interviews with ERP systems managers and directors in four organizations with significant global operations. It provides some exploratory evidence on the extent to which ERP systems meet, or can be enhanced to meet, SOX requirements. It reveals some significant technical and cultural challenges, such as systems inflexibility and diversity, systems security weaknesses, and resistance to change, as well as some benefits, such as improved process efficiency and systems security, and potential intangible long-term benefits. These findings enhance researchers' understanding of critical systems design features and processes, as well as common implementation challenges and benefits in global organizations. As such, they can serve as a basis for developing a comprehensive model of ERP systems effectiveness for implementing and operating effective controls in future research.

### Management Relevance Statement

In response to prominent financial scandals, the Sarbanes-Oxley Act imposed stringent internal control requirements over financial reporting for public organizations. This chapter examines the extent to which ERP systems are able to meet these requirements and challenges global organizations face in enhancing their ERP systems for this purpose. The four organizations studied have substantially completed their SOX implementations, although some work is still necessary. SOX requirements have often been implemented as part of other process and strategic improvement initiatives. The organizations have had to overcome some technical and cultural challenges, such as systems inflexibility and diversity, systems security weaknesses, and resistance to change. On the positive side, they also reported some benefits of SOX implementation, such as improved process efficiency and systems security, and potential intangible long-term benefits. These findings provide systems managers some insight into challenges and opportunities in enhancing ERP systems for SOX compliance, which can ultimately contribute to identifying best practices and enhancing long-term organizational effectiveness. Although controls cannot guarantee the prevention of future financial scandals, they can reveal significant errors, omissions, and questionable practices, and thus allow timely corrective actions. Such threats exert pressure on global organizations to continuously enhance controls and ERP systems, resulting in continuous cycles of control and systems adjustments.

## **SECTION VI: SUCCESS EVALUATION ASPECTS**

### Chapter XIV. Implementing ERP Systems in Multinational Projects: Implications for Cultural Aspects and the Implementation Process

#### Academic Relevance Statement

In this chapter, after a literature review on ERP implementation, three surveys on the success factors of ERP projects, performed in Germany, the United States, and Turkey, are presented with a detailed analysis of the validity of the results. Twenty-three hypotheses postulated in advance of the surveys are tested. Despite the very different outcome of the surveys, it proved all the hypotheses to be true. In the second section, three common lifecycle models for the implementation of ERP projects are evaluated in light of their capability of business process improvement. Finally, in the third section, the authors present a new semi-process-oriented lifecycle model, which avoids the shortcomings of the previously assessed ones and takes into account the findings from the surveys.

## Management Relevance Statement

In this chapter the authors present factors for the success of ERP implementation projects, an evaluation of common lifecycle models for implementing ERP software systems, and finally a new lifecycle model, which is based on the authors' findings. They performed surveys in Germany, the United States, and Turkey on the process and success factors for ERP projects. The results are discussed in light of Hofstede's model of cultural factors. In spite of the great variety of potential advantages, it is also necessary to illuminate the real effects of standard ERP software in practice. Recent studies have revealed that 81% of German companies interviewed using SAP do not fully exploit the software's ability to optimize business processes, though 61% stated that SAP offers very good process optimization opportunities. Therefore the authors evaluated popular lifecycle models with respect to their suitability to implement standard software in a process-driven way. Finally, the authors present a semi-process-oriented approach lifecycle model for the implementation and release changeover of ERP systems. This lifecycle model was developed from the authors' experience in practice, and its practical relevance was evaluated in real-world projects. This approach is also assessed in light of the criteria presented in the second section.

## Chapter XV. Success Factors for the Global Implementation of ERP/HRMS Software

### Academic Relevance Statement

There are few field studies on global enterprise resource planning implementations. This chapter focuses on one specific company's experiences with a global implementation, with particular focus on cultural differences, management support, resistance to change, trust, and communication-distance. All of these success factors, identified using existing literature, are evaluated against a global enterprise resource planning software implementation experienced by a real company, Global Software, Inc. Data were collected using semi-structured interviews and a questionnaire. The information within the chapter is useful for academicians conducting research on global ERP implementations, global information system implementations, and for those with an interest in learning more about success factors related to ERP implementations. Additional information is included regarding human resource management systems (HRMSs), a particular module within ERP software. HRMS is the focus of the field study due to company implementation time constraints.

### Management Relevance Statement

This chapter describes a field study for a global implementation of ERP software. Due to implementation time constraints put forth by the company, particular emphasis is placed on the human resources management system software module, which was implemented on a global basis. The HRMS stores employee data and supports payroll, benefits, and compensation processes. The information in this chapter will benefit companies, managers, and individuals interested in learning about issues a company experienced while implementing a global system. There are many factors that should be considered when implementing a global system. Five success factors, identified using existing literature, are evaluated against the implementation. Cultural differences, communication-distance, trust, management support, and resistance to change are discussed in-depth. While the software implementation overall is considered successful, the non-U.S.-based locations did not have a perceived improvement to existing processes. Data were collected using semi-structured interviews and a questionnaire.

## **SECTION VII: TRENDS**

### **Chapter XVI. ERP Trends, Opportunities, and Challenges: A Focus on the Gulf Region in the Middle East**

#### **Academic Relevance Statement**

This chapter identifies key opportunities and challenges pertaining to ERP implementation in the Gulf region of the Middle East. While many issues identified here have global applications, some are very particular to this region. For example, the adaptation of the ERP product to support the practices governing business operations in some industries, such as banking, is key to a successful ERP adoption. How an ERP system could support the development of financial institutions in this region with consideration to Islamic banking rules and regulations is both a challenge and an opportunity. Much of the academic literature on ERP is focused on western countries, with the exception of a few articles on South East Asian countries such as India and China. This chapter hence serves the academic community through providing an insight into: (1) the local context for this region, (2) ERP implementation issues that are relevant in this region, and (3) ERP implementation research opportunities in this area.

#### **Management Relevance Statement**

What are the important issues pertaining to ERP implementation in the Gulf region of the Middle East? With rising oil revenues, continuous positive growth, and relative political stability, there are extensive business prospects in the region, for both local and global investors. This chapter provides an overview of the opportunities available for ERP-related businesses in the region. It also highlights challenges, particularly those related to the local environment which vendors, consultants, and clients need to be aware of. Through exploring currents and future trends, this chapter not only helps ERP-related businesses focus their operational and strategic plans to capture business opportunities in this region, but also aids managers in client organizations in identifying ERP and ERP-related solutions that are likely to contribute to creating or maintaining a competitive position in the markets in which they operate.

### **Chapter XVII. The Future of ERP and Enterprise Resource Management Systems**

#### **Academic Relevance Statement**

The chapter begins with a theoretical analysis of the low adaptability of current ERPs to the needs of the organizations that should constitute their largest market in the near future: the small and medium-sized enterprises, as well as other organizations whose priority is not the mid- and long-term resource planning but the short-term and dynamic management of resources. It shows that the resource functionality must be structurally strengthened—and suggests a data structure for that goal—to allow ERPs to evolve into enterprise resource management systems. Then, the chapter discusses the main issues that future global or local ERPs will have to address to be able to satisfy some of the main expectations that current ERPs have not fulfilled: lower costs of licensing and implementation, including the Open Source Initiative licensing option; more standardization; higher inter-system compatibility; and less need for consulting.

## Management Relevance Statement

The chapter addresses some of the questions that managers, consultants, and other practitioners are asking about the future of ERPs:

1. What is the future of ERPs?
2. How can ERPs satisfy the needs of SME and other organization—even big ones—whose priority is not the mid- and long-term resource planning but the short-term, dynamic management of resources?
3. Will licensing and implementation costs become accessible for SMEs?
4. Will ERPs reach a global standard comparable to, say, the Microsoft Office suite or an open source propagation model like that of Linux?
5. Is there an intrinsic impediment for the standardization of ERPs or at least of the middleware aimed to make different ERPs compatible, communicable, and really able to transfer the best practices?

The chapter discusses the effects of a negative or positive answer to these questions and introduces some potential improvements that would facilitate the evolution towards the more dynamic short-term management of resources.

*Carlos Ferran*  
*The Pennsylvania State University, USA*

*Ricardo Salim*  
*Cautus Networks Corp*  
*Caracas, Venezuela*