Departament de Llenguatges i Sistemes Informatics
UNIVERSITAT POLITÈCNICA DE CATALUNYA

Enterprise Resource Planning : an Annotated Bibliography

Joan A. Pastor
pastor@lsi.upc.es
Departament de Llenguatges i Sistemes Informàtics
Universitat Politècnica de Catalunya
Campus Nord, Jordi Girona Salgado, 1-3
08034 Barcelona – Catalonia - Spain

José Esteves
jesteves@lsi.upc.es
Departament de Llenguatges i Sistemes Informàtics
Universitat Politècnica de Catalunya
Campus Nord, Jordi Girona Salgado, 1-3
08034 Barcelona – Catalonia - Spain

Abstract. Despite the growing interest of ERP area, publications on these systems within the academic information systems community, as reflected by contributions to international conferences and journals is only emerging. The goal of this study is to provide an annotated bibliography of the ERP publications published in the main Information Systems conferences and journals, and categorizing them through an ERP life-cycle based framework that is structured in phases. The phases are the different stages of an ERP system life-cycle within an organization.

Keywords: Enterprise Resource Planning, Information Systems, ERP Life-cycle, ERP phases, ERP survey.

Technical Research Report

November 2000

Index:

1 Introduction

Typically, Enterprise Resource Planning (ERP) systems are software packages composed of several modules, such as human resources, sales, finance and production, providing cross-organization integration of data through imbedded business processes. These software packages can be customized to answer the specific needs of each organization.

Regarding the significant impact of ERP systems on industry, Davenport (1998, p. 122) states that "the business world's embrace of enterprise systems may in fact be the most important development in the corporate use of information technology in the 1990s". The market for people who can work with these systems, implement these systems, and understand how these systems transform organizations is very big, and growing (Watson and Schneider 1999). Despite the growing interest of ERP area, publications on these systems within the academic Information Systems (IS) community, as reflected by contributions to international conferences and journals is only emerging. Research on ERP systems has been treated as a "secondary" research and its importance has been neglected by the IS community. But, lately, researchers have argued the need for more research in this area (Gable 1998, Gable et al. 1997b).

The goal of this study is to provide an annotated bibliography of ERP publications published in the main IS conferences and journals in the last three years, categorizing them through an ERP life-cycle based framework that is structured in phases. This bibliography is an extension of a previous bibliography reviewed by Gable and Rosemann (1999).

This paper is organized as follows. First, we present the bibliography search approach used. Then, the bibliography and review is described in detail. Finally, we make some considerations.

2 Bibliography Search Approach

In order to develop an overview of academic activity relating to ERP systems, key IS conferences and journals were scanned for the past three years. Academic events surveyed were:

ACIS - Australasian Conference on Information Systems

AMCIS - Americas Conference on Information Systems

ECIS - European Conference on Information Systems

EMRPS - Enterprise Management and Resource Planning: Methods, Tools and Architectures

HICSS - Hawaii International Conference on Systems Science

ICIS - International Conference on Information Systems

IRIS - Information Systems Research Seminar In Scandinavia

PACIS - Pacific Asia Conference on Information Systems

Journals surveyed were:

ACM - Association for Computing Machinery

CAIS - Communications of the Association for Information Systems

DSS - Decision Support Systems Journal

EJIS - European Journal of Information Systems

HBR - Harvard Business Review

IJIM - International Journal of Information Management

ISR - Information Systems Research

JGIM - Journal of Global Information Management

JIT - Journal of Information Technology

MISQ - Management Information Systems Quarterly

The search was made through the use of keywords such as enterprise resource planning, enterprise wide systems, enterprise systems or software packages and the main ERP vendors such as: SAP, Oracle, Baan, Peoplesoft, JD Edwards. Publications over the last four years were analyzed. We also analyzed the first conference in information systems of the year 2000, HICSS (three publications). Table 1 lists the number of publications identified from conferences. In the journals surveyed, we found only four publications, and two of these publications were presented in ICIS 98 (Hirt and Swanson 1999, Ross 1999). Also, we include some relevant publications of other scientific publications that we found during the collection process. In the past two years nearly all the IS conferences mentioned in table 1 dedicated panels to the subject, AMCIS (Panel 1999a), ECIS (Panel 1999b), ACIS (Panel 1998b) as well as the ICIS (Panel 1998a).

	1997	**1998**	**1999**	**2000**	**Σ**
IS events:					
ACIS	0	2	1		3
AMCIS	1	2	32	28	63
ECIS	0	2	4	6	12
EMRPS	-	-	29	-	29
HICSS	0	0	3	3	6
ICIS	1	4	4		9
PACIS	1	-	-		1
Others	1	5	9	8	23
IS journals	0	2	3	9	14
Others	1	2	4	3	10
Total:	5	19	89	57	170

Table 1. ERP publications at selected international IS conferences 1997-2000.

3 ERP Bibliography Analysis

After we collected all the publications, they were analyzed and categorized through a simplified version of an ERP life-cycle framework proposed by (Esteves and Pastor 1999). Some publications are not related to a specific phase of the ERP life-cycle, so, we included them in an ERP general directions section. Due to the great number of papers related to education, we created a section dedicated to that subject. We reviewed 170 publications, the majority from AMCIS and EMRPS. So far, EMRPS is the only academic event dedicated exclusively to ERP systems. The number of publications that are related to the implementation phase is greater than the number related to other phases (see Fig. 1). This corresponds to the focus on ERP systems given by the trade press, which also deals predominantly with implementation problems. This phase is described in detail in one section. The other phases are explained in another section denominated other ERP phases. Next, we describe in detail each one of the four sections.

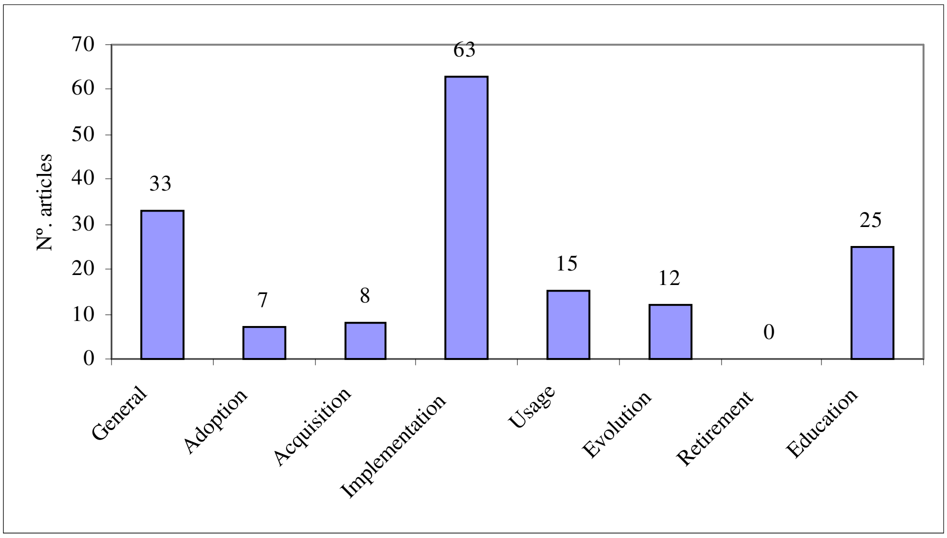

Fig. 1. Number of Publications by category

3.1 General Directions

We categorized the publications on ERP issues not related to life-cycle phases in four main topics: research issues, organizational knowledge, business modelling, and ERP product development issues. Next, we describe each topic in detail.

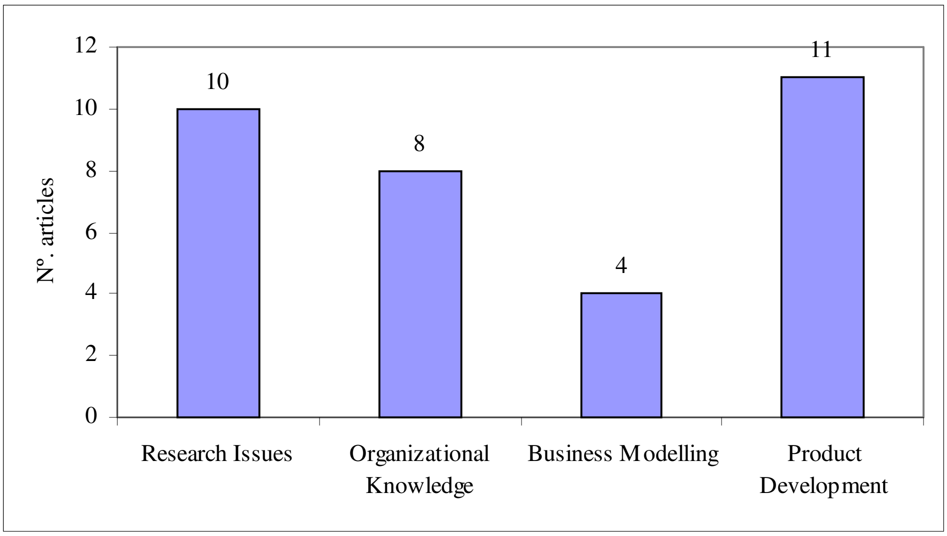

Fig. 2. Nº. of publications related with each topic of general directions.

3.1.1 Research Issues.

- Davenport (1998) gives an overview of ERP systems or Enterprise Systems as he called them, their main functions, their attractiveness and the problems related with their implementation. Davenport also analyzes the impact on a company's organization and culture.
- The research issues and overview of ERP systems are analyzed in some publications and some authors proposed research agendas (Esteves and Pastor, 1999; Mini-Panel, 1999).
- David et al. (1999) argue that research in ERP area must not proceed haphazardly; rather we must develop a systematic means for identifying the patterns underlying these systems and for comparing the symbolic abstractions among each other to reveal differences in function, information architecture, and organization.
- Holsapple and Sena (1999) have identified the integration of ERP and decision support systems for further research and development.
- Sor (1999) suggests that a better understanding of issues surrounding ERP systems could be achieved by moving the discourse towards management theory and dealing with ERP systems as special cases of theoretical premises that were developed in the sixties.
- Oliver and Romm (1999) present the motivations and expectations related with ERP systems.
- Ross and Vitale (1998) present the preliminary findings from a research project that examined how firms are generating business value from their investments in ERP systems.
- Kumar and Hillegersberg (2000) make an overview of ERP systems, some ERP experiences, issues and their evolution.
- Everdingen et al. (2000) analyze the ERP adoption by european midsize companies.

- Markus and Tanis (2000) provide a theoretical framework for analyzing, both retropectively and prospectively, the business value of enterprise systems.

3.1.2 Organizational Knowledge.

- Ronca (1999) mentions the need to invest in organizational knowledge and change management for an enterprise to be successful with the adoption of ERP.
- Taxen (1999) proposes a strategy for organizational knowledge evolution and describes how it can be applied in the ERP system context.
- Eliciting information about organizational culture via laddering in ERP environments is discussed by Rugg et al. (1999).
- Gable et al. (1998) develop a research project to understand what ERP knowledge exists within the key players (vendors, implementation partners and clients) and to better understand what the three key players can do with ERP knowledge.
- Al-Mashari (2000) explores the ERP phenomenon from a process change management perspective and provides foundation and recommends several ideas for future research.
- Rosemann and Chan (2000) propose a framework which structures the knowledge required to manage enterprise systems and they suggest how knowledge can be modeled in the enterprise systems context in order to identify the relevant knowledge during different stages of an enterprise systems project.
- Klaus and Gable (2000) explore the conceptions of knowledge management held by senior managers who are 'immersed' in ERP systems.
- Hedman (2000) presents a competing value approach enterprise systems (CES) framework for discussing enterprise systems from an organizational effectiveness perspective.

3.1.3 Business Modelling.

The business modelling process helps organizations in the definition of a good business vision that will reduce the effort of capturing the functionality of ERP business model and therefore, minimize the effort associated to software configuration.

- Konstantas et al. (1999) propose a new paradigm for building business IS, the active business objects (ABOs). The ABO project aims at the design and development of an agent platform where mobile agents represent business processes. The agents encapsulate the policies, business practices and models of different business activities.

– Stirna (1999) analyzes the acquisition of Enterprise Modelling tools. He also outlined a number of situational factors to be considered by organizations when choosing between Enterprise Modelling tool acquisition strategies.
– Formica and Pizzicannella (1999) discuss a new approach for high-level enterprise modelling referred to as reification. The approach is based on the reification of the Business Processes of an enterprise, that is, their representation as static entities by using the structural OO constructs. Wagner (1999) shows that enterprise and business process modelling could greatly benefit from agent-oriented approach, called Agent-Object-Relationship (AOR) modelling.

3.1.4 ERP Product development Issues.

This category is related with the first-hand development and manufacturing of ERP products.
– Sutcliffe (1999) proposes a framework for engineering reusable components that serves two purposes. First, it can act as a tool for thought for designers by making design trade-off explicit and secondly, it proposes a cost driven evaluation of reusable components which can inform decision making during reuse oriented development.
– Frank (1999) uses the latest research within extended transaction models, replication methods and countermeasures against the missing isolation property in order to illustrate how to design distributed ERP systems with high performance and availability.
– Platner (1996) describes the SAP R/3 software development process and the possibilities R/3 offers for "configuration to order".
– Sprott (2000) describes how the componentization of ERP packages is likely to evolve.
– Huang (1998) analyzes the influence of customer requirements in the ERP software development process.
– Loos (2000) focuses on future development of ERP systems emphasizing on technical aspects of information technology application as enabler.
– Chellappa and Saraf (2000) adopt a framework called network theory to represent the complexity of ERP market. We this framework, authors relate alliances formation by business application software firms and compability issues.
– Kobryn (1998) analyzes the requirements of enterprise software architectures and examines the UML constructs and techniques to specify them.
– A historical perspective has been taken by Chung and Kelly (Chung and Synder 1999, Kelly et al. 1999) who, from different contexts, emphasize the maturing of IS towards an unambiguous business focus, as attributed to ERP systems.
– Other traditional approaches in systems development have also proven to be less beneficial in the long-term than ERP systems (Holland and Light 1999b).

3.2 ERPs along their Life-cycle

We use the ERP life-cycle framework proposed by Esteves and Pastor (1999). The framework is structured in phases. The phases of the ERP life-cycle consist in the several stages that an ERP system goes through during its whole life within the hosting organization. They are the following: adoption decision, acquisition, implementation, use and maintenance, evolution and retirement phase. Next, we describe each phase:

- **Adoption decision phase.** This phase is the one during which managers must question the need for a new ERP system while selecting the general information system approach that will best address the critical business challenges and improve the organizational strategy. This decision phase includes the definition of system requirements, its goals and benefits, and an analysis of the impact of adoption at a business and organizational level.

- **Acquisition phase.** This phase consists of the product selection that best fits the requirements of the organization thus, minimizing the need for customization. A consulting company is also selected to help in the next phases of the ERP life-cycle especially in the implementation phase. Factors such as functionality, price, training and maintenance services are analyzed and the contractual agreement is defined. In this phase, it is also important to make an analysis of the return on investment of the selected product.

- **Implementation phase.** This phase consists in the adaptation of the binomial ERP system-organization. Thus, the customization or parameterization and adaptation of the ERP package acquired is made, according to the needs of the organization. Usually this task is made with the help of consultants who provide implementation methodologies, know-how and training. Although training will be present in all the phases, the largest investment is made during the implementation phase.

- **Use and maintenance phase.** This phase consists in the use of the product in a way that returns expected benefits and minimizes disruption. During this phase, one must be aware of the aspects related to functionality, usability and adequacy to the organizational and business processes. Once a system is implemented, it must be maintained, because malfunctions have to be corrected, special optimization requests have to be met, and general systems improvements have to be included.

- **Evolution phase.** This phase corresponds to the integration of more capabilities into the ERP system, providing new benefits. The extensions can be classified in two types: the first one is the evolution "upwards" with functionality oriented to decision making with applications such as advanced planning and scheduling, datawarehouses and business intelligence systems; the second type is the evolution "to outwards" its environment, with applications such as customer relationship management, supply-chain management, inter-organizational workflow and electronic commerce.

- **Retirement phase.** This phase corresponds to the stage when with the appearance of new technologies or the inadequacy of the ERP system or approach to the business needs, managers decide if they will substitute the ERP software with other information system approach more adequate to the organizational needs of the moment. Some organizations have just passed through this phase by several reasons such as: strategic changes, lack of trust in the ERP vendor or the implementation partner and, bad implementation experiences.

3.2.1 Implementation Phase

The publications related with the implementation phase were divided in five main topics: implementation approaches, implementation methodologies, implementation success, other implementation issues and implementation case studies (see fig. 3). Next we will describe each topic.

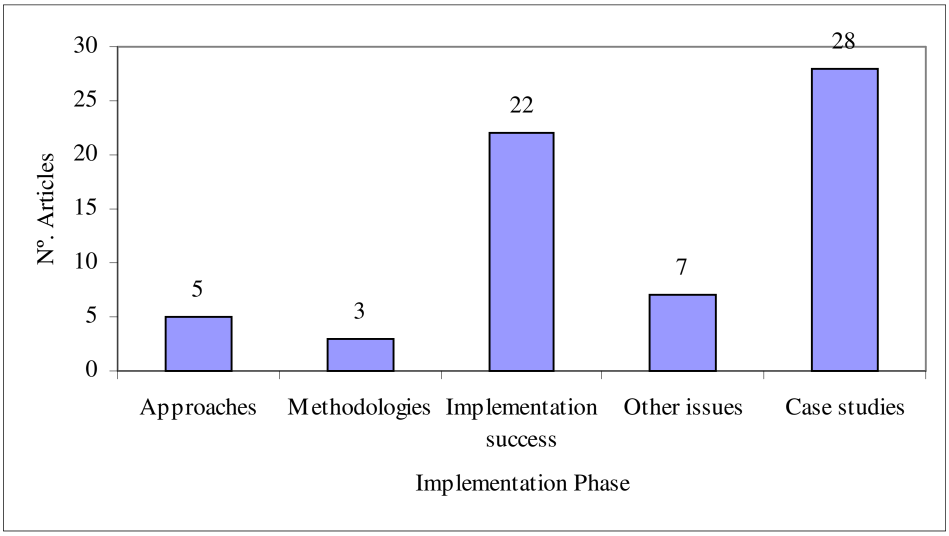

Fig. 3. Nº. of publications related with each topic of implementation phase.

3.2.1.1 Implementation approaches.

- Davenport (1996), Davenport (1998) says that the package implementation process is equally distinct and roles, responsibilities and the necessary skill set, have changed substantively from those associated with a more traditional custom implementation.
- Gibson et al. (1999) argue that ERP software implementation requires a different approach that places less emphasis on the technical aspects of software implementation and instead seeks to balance the business process design, software configuration and project management aspects of information technology implementation with the overall strategy and structure of the firm.
- Milford and Stewart (2000) describe the design of a qualitative research project that seeks to determine if ERP implementations are qualitatively different from other large system implementations.
- Parr and Shanks (2000) argue that the concept of an ERP implementation is not a generic concept, and they present a taxonomy of ERP implementation categories. They further argue that understanding the differences between the different categories is crucial to future research in ERP implementations.

3.2.1.2 Implementation methodologies.

- Hazebrouck and Frerichs (1999) analyze and describe the usage of ASAP methodology. Fichtenbauer (1999) treats the problems, experiences and solutions of the organization of processes in combination with SAP-projects. The author used an ARIS approach.
- Scheer and Habermann (2000) explain the benefits of using business process models to achieve positive results.

3.2.1.3 Implementation success.

- Recent publications (Gibson and Mann, 1997; Bancroft et al., 1998; Holland et al., 1999c; Holland and Light, 1999e; Parr et al., 1999; Stefanou, 1999; Sumner, 1999a; Sumner, 1999b; Vikram et al., 1999) attempt to identify critical success factors on ERP implementations. Esteves and Pastor (2000) unified these works in a unified model of critical success factors.
- Bingi et al. (1999) discuss the critical issues affecting an ERP implementation.
- Brown and Vessey (1998) have started the identification of ERP implementation variables that may be critical to a successful implementation. These variables are then incorporated into a preliminary contingency framework.
- Dong (2000) proposes a conceptual model exploring impacts of top management on enterprise systems implementation effectiveness.
- Stewart et al. (2000) describe a research program being undertaken to identify the variables that inhibit an ERP implementation.
- Somers et al. (2000) propose an integrative framework and taxonomy derived from the socio-technical view of organizations and other extant theories that illustrates the multifaceted nature of ERP implementations.
- Southwick and Sawyer (1999) argue the importance of analyzing managerial and social issues surrounding ERP implementation by applying critical social theory.
- Bunker (2000) analyses the ERP contextual skills issues need to be adressed in order to facilitate the successful transfer and implementation of these IS into varied organisational contexts.
- Willcocks and Sykes (2000) analyze the role of the CIO and IT function in an ERP implementation, prociding three scenarios of this role.
- Densley (1999) sets out the key issues to enable successful ERP implementations.
- Gable and Stewart (1999) analyze the ERP issues in small and medium enterprises.
- Rosemann and Wiese (1999) adapt the balanced scorecard approach to evaluate the implementation and usage of ERP systems.

- Soh et al. (2000) survey the different misfits observed, i.e. the gap between the functionality offered by the package and that required by the adopting organization. They also analyze the strategies employed, and the related impacts on organizations.

3.2.1.4 Other implementation issues.

- Markus et al. (2000) examine the variety of multisite structures and the configuration and implementation associated with them.
- Umar and Missier (1999) develop a knowledge-based decision support workbench with the goal of reducing the integration and migration effort.
- Daneva (1999) suggests an approach to deal with the identification and measurement of reuse in requirements conceptualization phase of the SAP R/3 component configuration cycle.
- Decision making under the aspect of whether to implement ERP with or without BPR has been surveyed and analyzed by Bernroider and Koch (1999).
- Theoretical considerations have focussed on global business processes (Basu and Palvia 1999) and information technology architecture options (Chan 1999).
- Lindvall (2000) discusses the changes before, and just after, the implementation of an SAP/R3-system. He gives attention to changes in the implementing organisation, especially focusing on the effects of the finance function.

3.2.1.5 Implementation case studies.

Several case studies have been documented with different perspectives:

- to analyze the ERP impacts based in a benefit/costs analysis (Gattiker and Goodhue, 2000);
- to describe the impact of ERP on job characteristics (Pawloski et al., 1999);
- to make recommendations on how to maximize the benefits from ERP (Niehus et al., 1998) or how to avoid ERP project failures (Scott, 1999a);
- to demonstrate how myth-making served to construct an ERP system as an 'ideal' system and the legacy system as a 'dying system' (Alvarez 2000);
- To analyze the key decisions of the development team and key success factors (Clemons, 1998);
- to decide on to an ERP adoption and implementation (Hirt and Swanson, 1998; Hirt and Swanson, 1999);
- to describe the journey of Geneva pharmaceuticals through the first two of three phases of SAP R/3 implementation project (Bhattacherjee, 2000);

- to identify the critical elements of business processes and ERP systems alignment (Smethurst and Kawalek, 1999; Volkoff, 1999);
- to explore strategic options open to firms beyond the implementation of common business systems (Holland et al., 1999d);
- to describe the implementation of a SAP system in a multi-cultural organization (Gulla and Mollan, 1999);
- to standardize ERP templates within the different ERP systems of an organization (Huber et al., 2000);
- Business Process Reengineering (Slooten and Yap, 1999; Ross, 1998; Ross, 1999) and change management (Pérez et al., 1999; Amin et al., 1999);
- to know the causes and nature of changing requirements in user's requirement definition (Rugg and Hooper, 1999);
- to analyze the special challenges of ERP implementations outside the business world (Hanseth and Braa, 1998; Sieber and Nah, 1999; Sieber et al., 1999; Holland et al., 1998; Holland and Light, 1999a);
- to describe global supply chain management (Chatfield and Andersen, 1998);
- to examine a model that proposes various antecedents to successful e-business change management in ERP environments (Ash, 2000).

3.2.2 Other ERP Life-cycle Phases

3.2.2.1 Adoption.

- Oliver and Romm (1999) emphasize the need for further research into the planning phase of the adoption process and outlined some of the principles that should form the basis of empirical research in this area.
- Rugg and Krumbholz (1999) mention the importance of correctly modelling the organizational culture before selecting and installing a system. They describe a model of culture which can be applied to the ERP context and describes a framework for selection of an elicitation technique for modelling organizational culture.
- Fulford and Solanki (2000) describe the requirements, risks and rewards of an ERP adoption in a manufacturing organisation.
- (Hirt and Swanson 1998; Hirt and Swanson 1999) develop a case study where is analyzed one ERP adoption process.
- Monday (2000) examines the potential scope of ERP for supply chain management in the wine industry and the extent to which ERPs can be considered as a potential solution.

- Oliver and Romm (2000) outline the significance of ERP systems and analyse the factors that lead to ERP adoption within universities.

3.2.2.2 Acquisition.

- Sistach et al. (1999), Sistach and Pastor (2000) propose a method for the acquisition of an ERP system in small and medium enterprises (SMEs).
- Stefanou (2000) provides a framework for the selection process of ERP Systems, which can be useful for both identifying critical issues for further research and assisting managers considering ERP projects.
- Brown et al. (2000) identify a set of business and IT factors that are associated with the purchase of ERP systems.
- Shakir (2000) maps six models of decision-making to the evaluation, selection and implementation phases of an ERP system and conceptualizes the study with a case study.
- Bernroider and Koch (2000) detail the results from an empirical study concerning differences in characteristics of the ERP system selection process between small or medium and large sized organizations.
- Leist and Winter (1998) develope a cost-based model of information systems optimization to derive an optimal allocation of business packages.
- Sammon and Adam (2000) present a literature-based model of ERP software selection that pretends to be the foundation for a model of managerial decision making for ERP projects.
- Maiden et al. (1999) propose the usage of use cases and scenarios to help vendors specify their products.

3.2.2.3 Use and Maintenance.

- Holland et al. (2000) present a framework for understanding the process and content of the development of the maturity of ERP systems in organisations.
- Shang (2000) presents a framework that tries to classify the types of benefit that organizations can achieve by using ERP systems and provide a comprehensive foundation for planning, justifying, and managing the system.
- Pozzebon (2000) identifies the factors affecting ERP usage, combining a structuration perspective with a behavioral-based model.
- Kelley et al. (1999) analyze the 'individuals’ reactions to ERP technology and subsequent behaviors through the combination of Self-Efficacy Theory and Attribution Theory.

- Stijn and Wijnhoven (2000) apply the systematic analysis method of memory mismatches (SAMMM) to ERP systems in the usage stage and it's theoretical and practical value and limitations have been identified.
- Granlund and Malmi (2000) analyze the effects of ERP systems on manangement accounting and management 'work, especially whether ERP systems alleviate or limit the added value gained from management accounting systems for organizational decision making and control.
- Fahy and Lynch (1999) examine the impact of ERP systems on organizations and in particular on the manangement accounting functions of large organizations that have implemented ERP systems.
- Stamper (1999) points out the limitations of current ERP systems and introduced the principles on which the second generation could be built to achieve massive reductions in development, support and maintenance costs.
- Glass and Vessey (1999) analyze the maintenance and enhancement tasks related of ERP systems, trying to know if ERP maintenance follows the 60/60 rule and to know if user-driven ERP system enhacement is treated as it is for traditional IS.
- Loo (2000) proposes the implementation of an information technology service management capability to help in the management of information technology associated to the ERP solution implemented.
- Rosemann and Wiese (1999) propose the evaluation of ERP software usage through a based balanced scorecard approach.
- Eriksen et al. (1999) propose that the advantages of competence centers to support and maintain these large-scale systems should be explored.
- Kremers and Dissel (2000) discuss the motives and inhibitors for migrating ERP, i.e. migrate to a new version of the system, and considered in terms of the provider and customer viewpoint.
- Doppelhammer et al. (1997) study the database performance of SAP R/3 using a standard benchamark for decision support queries in business environments, denomitated TPC-D.
- Riet et al. (1998) study how ERP systems deal with the security issue.

3.2.2.4 Evolution Phase.

Some authors analyze new emerging ERP technologies and new business models.

- Shaw (1999) analyzes the use of Web technology and its relation with supply-chain management.
- Lenzerini et al. (1999) propose a framework for providing an integrated view of data, which can deal with data used from different kinds of applications.

- Park (1999) develop a framework for a design interface module in ERP systems that automatically extracts features required for a process planning.
- Meier et al. (2000) develop an Editorial Workbench that helps to manage knowledge spread in internal and external sources in order to distribute the right information to the responsible manager in time.
- Rosemann et al. (1999) introduce two different approaches for possible workflow-based ERP architectures and discussed the related advantages and constraints.
- Bergamaschi et al. (1999) propose a data replication model, called DOT (Dynamic Ownership Transition), to realize the integration between workflow and database technology to support data intensive workflow applications.
- Schönefeld and Vering (2000) present a conception for an integration of ERP systems and Computer Supported Cooperative Work (CSCW) and they describe the benefits of the integration of both worlds.
- Last and Maimon (1998) provide an approach to knowledge discovery in databases (KDD) applied to ERP databases.
- Assogna (1999) presents a project to explore the possibility of "automating" the generation of a decision support and operational IS, starting from an initial "business idea" of Top management.
- Mylopoulos (1999) reviews goal-analysis research in requirements engineering and illustrates how it can facilitate the customization of a customer relationship management system.
- Becker and Bölsche (2000) present an approach to facilitate electronic coordination in enterprise spanning business to business relationships.
- Themistocleous (2000) describes the application integration arena and proposes a taxonomy for this new scope of technology. He also analyses the factors related with the impact of application integration on organizations.

3.2.2.5 Retirement Phase.

We did not find any publication related to this phase but some publications (e.g. Davenport 1998, Scott 1999a) cited some cases of ERP systems retirement for various reasons. Some publications appeared in the Press (e.g. *New York Times, Wall Street Journal, the Economist*) relating some ERP implementation disasters. The most famous retirement case is FoxMeyer Drugs (Scott 1999a). Now, the majority of organizations are in the implementation or in the use and maintenance phases. We expect that in the future these cases will be analyzed in more detail.

3.3 ERP and Education

The interest on ERP systems by the universities is evidenced by the number of publications published (see fig. 4). Universities analyzed the use of ERP in education, ERP courses and how to change the IS curricula to incorporate ERP systems.

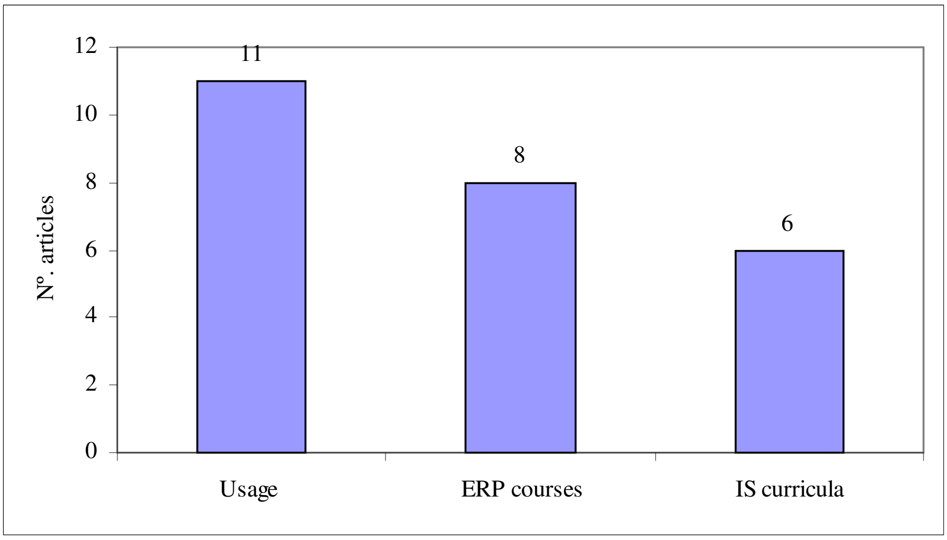

Fig. 4. N. publications related with ERP and education.

3.3.1 ERP usage by Universities.

- Over the past few years, some of the ERP vendors have provided a special arrangement that encourages universities to incorporate ERP concepts and technologies into the education process (Watson et al. 1999, Scott and Gable 1997, Panel 1999).
- Some experiences related to teaching SAP can be found in (Watson and Schneider 1999, Stewart et al. 1999) or the usage of case studies of ERP implementation (Avital and Vandenbosch 1999, Hirt and Swanson 1998, Ross 1998).
- The benefits and pitfalls of teaching conceptual knowledge with ERP systems as a learning vehicle have been critically evaluated in terms of learning outcomes and effort by (Noguera and Watson 1999, Scott 1999b).
- Individual experiences of universities implementing SAP R/3 into their IS curriculum can be found in (Antonucci 1999, Watson and Schneider 1999, Stewart et al. 1999).
- An analysis of how ERPs may affect operation research practice and research in the future and potential areas of interest within the broad field of operations research (Robinson and Dilts 1999)

3.3.2 ERP courses.

- The university ERP-vendor link has already spawned new curricula at the postgraduate level, either under the banner of a new breed of MBA program (Winter 1999) or within the Information systems area as a Master od Science program (Holmes and Hayen 1999b).
- Foote (1999) describes some accounting other SAP-related courses in the US.
- Shoemaker (1999) sketches a six-hour ERP-introduction for sales and marketing professionals. Stewart et al. (1999) have reported the impact of reorganizing ERP subject matter into existing curricula and the special challenges posed to faculty.
- ERP cannot be properly understood without a concept of object-oriented programming; a newly devised syllabus Flatscher (1999) aims at making these systems concepts apprehensible to MBA students.
- Holmes and Hayen (1999a) give an example of a syllabus for remote delivery of an introductory subject via the web. The SAP alliance university is a good source of information related with ERP courses.
- Rosemann et al. (2000) present the results from an empirical survey that give an overview about current activities in the area of collaborative ERP teaching. They also present an international pilot to teach ERP in the form of virtual teams.

3.3.3 IS curricula.

- The potential and challenges for IS education and research in tertiary education posed by this new category of manufacturing and business packaged software were initially identified by Gable et al. (1997a).
- The demand of human resources specialized in ERP systems and the related lack of experience in IS curricula, originated an answer from the universities that try to follow the market needs. Becerra-Fernandez et al. (2000) summarize the ongoing processed followed and challenges encountered by the Florida International University's College of Business Administration in order to achieve their vision of integrated curriculum.
- Watson and Schneider (1999) identify opportunities for incorporating the ERP body of knowledge into an IS program. They also discuss related cost and critical success factors.
- Gable and Rosemann (1999) made an international survey about the usage of ERP in universities and summarized the results of the study. They proposed the creation of a Web portal to publish and promote the sharing of information between academicals.
- Stewart (2000) presents and discusses the design of a problem based learning approach that seeks to embed industrial knowledge in the curriculum. He describes a project that is developing a business reference model using process engineering techniques.
- Rosemann (2000) presented a workshop that provides lecturers new in this area with practical guidelines for the continuous management of an ERP-related curriculum.

4 Conclusions

Publications within the information systems community on ERP systems appear to be limited in number so far as compared to the business that they have generated; in particular, publications originate from a small number of sources and only recently. During the year 2000 all the main IS conferences dedicate a track or mini-track to ERP systems.

This study evidences the effort made by researchers in implementation phase analysis. Until now, the other phases have been 'forgotten'. One of the reasons is because the majority of organizations are in the implementation phase and because in some phases there is a strong intervention of consultants what makes very difficult the access to information. The ERP systems offer many potential areas for research, several of which were evidenced in this paper. Due to their pervasive nature, ERP systems are of interest for a wide range of professional and scholarly communities, from software engineering to accounting, apart from the IS field. This suggests that ERP related research might have or gain a transdiciplinary dimension, which needs to be taken into consideration for future literature overviews. We think that in the next two years the number of publications will grow exponentially because many universities have created research areas in ERP systems and the interest of the IS community grown as well.

5 References

Al-Mashari M. 2000. "Constructs of Process Change Management in ERP Context: A Focus on SAP R/3", Americas Conference on Information Systems (AMCIS), K., USA.

Alvarez R. 2000. "Examining an ERP implementation through Myths: A Case Study of a Large Public Organization", Americas Conference on Information Systems (AMCIS), K., USA.

Amin N., Hinton M., Hall P., Newton M., Kayae R. 1999. "A Study of Strategic and Decision-Making Issues in Adoption of ERP Systems Resulting from a Merger in the Financial Services Sector". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 173-181.

Antonucci Y. L. 1999. "Enabling the business school curriculum with ERP software: experiences of the SAP University Alliance". 27th International Business School Computing Association (IBSCA), Atlanta, USA.

Ash C. 2000. "e-Business Change and Personnel Performance: A Case Study of an ERP Enabled Organisation", 10th Annual BIT conference, Manchester, UK., November 2000.

Assogna P. 1999. "Supply Chain Networks and Fractals: a Modelling Opportunity". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 311-318.

Avital M., Vandenbosch B. 1999. "SAP Implementation at Metalica: an Organizational Drama". International Conference on Information Systems (ICIS), Charlotte, USA.

Bancroft N., Seip H., Sprengel A. 1998. "Implementing SAP R/3", 2nd ed., Manning Publications, 1998.

Basu C., Palvia P. C. 1999. "Towards developing a model for global business process reengineering", Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Becerra-Fernandez I., Murphy K., Simon S. 2000. "Integrating ERP in the Business School Curriculum", Communications of the ACM, vol. 43, nº. 4, April 2000, pp. 39-41.

Becker C., Bölsche D. 2000. "New means for ERP Systems by eContracting", Americas Conference on Information Systems (AMCIS), K., USA.

Bergamaschi S., Vincini M., Castano S., Sartori C. 1999. "Distributed Database Support for Data-Intensive Workflow Applications". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 271-282.

Bernroider E., Koch S. 1999. "Decision Making for ERP-Investments from the Perspective of Organizational Impact - Preliminary Results from an Empirical Study". Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Bernroider E., Koch S. 2000. "Differences in Characteristics of the ERP System Selection Process between Small or Medium and Large Organizations". Americas Conference on Information Systems (AMCIS), K., USA.

Bingi P., Sharma M. K., Godla J. K. 1999. "Critical Issues Affecting an ERP Implementation", Information Systems Management, Vol. 16 issue 3, Summer 1999, pp. 7-8.

Bhattacherjee A. 2000. "Beginning SAP R/3 Implmentation at Geneva Pharmaceuticals", Communications of AIS, vol. 4, article 2, August 2000.

Brown C., Vessey I. 1999. "ERP Implementation Approaches: Toward a Contingency Framework,". International Conference on Information Systems (ICIS), Charlotte, USA.

Brown C., Vessey I., Powell A. 2000. "The ERP Purchase Decision: Influential Business and IT Factors", Americas Conference on Information Systems (AMCIS), K., USA.

Bunker D. 2000. "Enterprise Resource Planning (ERP) System Tools: the Context of their Creation and Use Within the Technology Transfer Process", Americas Conference on Information Systems (AMCIS), K., USA.

Caglio A. L, Newman M. 1999. "Implementing Enterprise Resource Planning Systems (ERPS): Implications for Management Accountants". International Conference on Information Systems (ICIS), Charlotte, USA.

Chan S. S. 1999. "Architecture Choices for ERP Systems". Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Chatfield A. T., Andersen K. V. 1998. "Playing with LEGO: IT, coordination and global supply management in a world leader toy manufacturing enterprise". European Conference on Information Systems (ECIS), Aix-en-provence, France.

Chellappa R., Saraf N. 2000. "Standards and Alliances in Non-Standardized Software Industries", Americas Conference on Information Systems (AMCIS), K., USA.

Chung S. H., Synder C. A. 1999. "ERP initiation - A Historical Perspective". Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Clemons C. 1998. "Successful Implementation of an Enterprise System: a Case Study", Americas conference on Information systems (AMCIS), Baltimore, USA.

Daneva M. 1999. ";Measuring Reuse of SAP Requirements: a Model-based Approach", proceedings of the fifth symposium on software reusability, 1999, pp. 141-150.

Davenport T. H. 1996. "Holistic management of mega-packaging change: the case of SAP". Americas Conference on Information Systems (AMCIS), Phoenix, USA.

Davenport T. H. 1998. "Putting the Enterprise into the Enterprise System". Harvard Business Review. Jul- Aug, pp. 121-131.

David J. S., Dunn C. L., McCarthy W. E. 1999. "Enterprise Resource Planning Systems Research: the Necessity to Explicating and Examining Patterns in Symbolic Form". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 347-357.

Densley B. 1999. "The Magnificient 7, getting the Biggest Bang from the ERP Buck". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 59-65.

Dong L. 2000. "A Model for Enterprise Systems Implementation: Top Management Influences On Implementation Effectiveness", Americas Conference on Information Systems (AMCIS), K., USA.

Doppelhammer J., Höppler T., Kemper A., Kossmann D. 1997. "Database Performance in the Real World: TPC-D and SAP R/3", Proceedings of the ACM SIGMOD international conference on Management of Data, 1997, pp. 123-134.

Eriksen L. B., Axline S., Markus M. L., Drucker P. F. 1999. "What Happens After "Going Live" With ERP Systems? Competence Centers Can Support Effective Institutionalization". Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Esteves J., Pastor J. 1999. "An ERP life-cycle-based Research Agenda". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 359-371.

Esteves J., Pastor J. 2000. "Towards the Unification of Critical Success Factors for ERP Implementations", 10th Annual BIT conference, Manchester, UK., November 2000.

Everdingen Y., Hillegersberg J., Waarts E. 2000. "ERP Adoption by European Midsize Companies", Communications of the ACM, vol. 43, nº. 4, April 2000, pp. 27-31.

Fahy M. J., Lynch R. 1999. "Enterprise Resource Planning (ERP) Systems and Strategic Management Accounting". European Accounting Association (EAA) Conference, Bordeaux, France.

Fichtenbauer C. 1999. "BPR including SAP-projects with ARIS-Toolset Problems, expriences and solutions". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 71-75

Flatscher R. G. 1999. "A syllabus for introducing MBA students to procedural and object-oriented programming (Object REXX)". Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Foote P. S. 1999. "SAP R/3 curriculum development for undergraduate and graduate accounting information systems track". Accounting Information Systems Educator Conference.

Formica A., Pizzicannella R. 1999. "On the Reification of Business Processes". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 319-328.

Frank L. 1999. "Design of Distributed ERP Systems with Semantic ACID Properties". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 229-238.

Fulford H., Solanki P. 2000. "A Manufacturing Organisation Prepares for ERP: Requirements, Risks and Rewards", 10th Annual BIT conference, Manchester, UK., November 2000.

Gable G., Scott J., Erlank S., Heever R. van D. 1997a. "Using Large Packaged Software in Teaching: The Case of SAP,". Americas Conference on Information Systems (AMCIS), Indianapolis, USA.

Gable G., Heever R. van D., Erlank S., Scott J. 1997b. "Large Packaged Software: the need for research". 3rd Pacific Asia Conference on Information Systems (PACIS), Brisbane, Australia.

Gable G. 1998. "Large Package Software: a Neglected technology?". Journal of Global Information Management, vol 6, nº 3, summer 1998.

Gable G., Scott J. E., Davenport T. H. 1998. "Cooperative ERP Life-cycle Knowledge Management". Proceedings of the 9th Australasian Conference on Information Systems (ACIS), Sydney, Australia.

Gable G., Rosemann M. 1999. "ERP in University teaching & Research: an International Survey". 3rd Annual SAP Asia Pacific, Institute of Higher Learning Forum, Singapore.

Gable G., Stewart G. 1999. "SAP R/3 Implementation Issues for Small to Medium Enterprises". Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Gattiker T. F., Goodhue D. L. 2000. "Understanding the Plant Level Costs and Benefits of ERP: Will the Ugly Duckling Always Turn into a Swan?". 33rd Hawaii International Conference on Science Systems (HICSS), Maui, Hawaii.

Gibson N., Holland C. P., Light B. 1999. "Enterprise Resource Planning: A Business Approach to systems Development". 32nd Hawaii International Conference on Science Systems (HICSS), Maui, Hawaii.

Gibson J., Mann S. 1997. "A qualitative examination of SAP R/3 implementations in the Western Cape", an empirical research report presented to the department of information systems, University of Cape Town.

Glass R. L., Vessey I. 1999. "Enterprise Resource Planning systems: Can they Handle the Enhancement changes Most Enterprises Require?". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 1-14.

Granlund M., Malmi T. 2000. "The Liberations and Limitations of ERP-systems for management accounting", 23th EAA Conference, March 2000, Munich, Germany

Gronwald K. D. 1999. "The SAP University Competence Center Concept". Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Gulla J. A., Mollan R. 1999. "Implementing SAP R/3 in a Multi-cultural Organization". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 127- 134.

Hanseth O., Braa K. 1998. "Technology as Traitor: Emergent SAP Infrastructure in a Global Organization". International Conference on Information Systems (ICIS), Helsinki, Finland.

Hazebrouck P., Frerichs P. 1999. "Use and Enhancement of Accelerated SAP: An Example". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 153-171.

Hedman J. 2000. "The CES Framework for Discussing ES", Americas Conference on Information Systems (AMCIS), K., USA.

Hirt S. G., Swanson E. B. 1998. "Adopting SAP at Siemens Power Corporation.". Information Conference on Information Systems (ICIS), Helsinki, Finland.

Hirt G. S.., Swanson E. B. 1999. "Adopting SAP at Siemens Power Corporation". Journal of Information Technology. Vol. 14, nº. 3, pp. 243-251.

Holland C. P., Light B., Gibson N. 1998. "Global Enterprise Resource Planning Implementation". Americas Conference on Information Systems (AMCIS), Baltimore, USA.

Holland C. P., Light B. 1999a. "Global Enterprise Resource Planning Implementation". 32nd Hawaii International Conference on Science Systems (HICSS), Maui, Hawaii.

Holland C. P., Light B. 1999b. "Generic Information Systems Design Strategies". Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Holland C. P., Light B., Gibson N. 1999c. "A Critical Success Factors Model for Enterprise Resource Planning Implementation". 7th European Conference on Information Systems (ECIS), Copenhagen, Denmark.

Holland C. P., Light B., Kawalek P. 1999d. "Beyond Enterprise Resource Planning Projects". 7th European Conference on Information Systems (ECIS), Copenhagen, Denmark.

Holland C. P., Light B. 1999e. "Critical Success Factors Model for ERP Implementation". IEEE Software, May/June, (16)30-36.

Holland C., Light B., Beck P. 2000. "An International Analysis of the Maturity of Enterprise Resource Planning (ERP) Systems Use, Americas Conference on Information Systems (AMCIS), K., USA.

Holmes M. C., Hayen R. L. 1999a. "An introduction to enterprise software using SAP R/3: a web-based course". Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Holmes M. C., Hayen R. L. 1999b. "The Master of Science in Information Systems in a regional Midwestern university". Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Holsapple C. W., Sena M. P. 1999. "Enterprise systems for Organizational Decision Support: A Research Agenda". Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Huang Q. 1998. "Developing Trends of ERP Software and ERP Practice in China". IFAC-5d-013. International Federation of Accounts (IFAC).

Huber T., Alt R., Österle H. 2000. "Templates - Instruments for Standardizing ERP Systems". 33rd Hawaii International Conference on Science Systems (HICSS), Maui, Hawaii.

Kelley H., Compeau D., Higgins C. 1999. "Attribution Analysis of Computer Self-Efficacy", Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Kelly S., Holland C., Light B. 1999. "Enterprise Resource Planning: A Business Approach to Systems Development". Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Klaus H., Gable G. 2000. "Senior Manager's Understandings of Knowledge Management in the Context of Enterprise Systems", Americas Conference on Information Systems (AMCIS), K., USA.

Kobryn C. 1998. "Modeling Enterprise Software Architectures Using UML". 2nd International enterprise Distributed Object Computing Workshop, San Diego, USA.

Konstantas D., Morin J. H., Barziv O., Koumpis A., Kobel C. 1999. "Active Business Objects (ABOs): A Novel Paradigm for Building (and using!) Business Information System". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 249-258.

Kumar K., Hillergersberg J. 2000. "ERP experiences and evolution", Communication of the ACM, vol. 43, nº. 4, April 2000, 23-26.

Last M., Maimon O. 1998. "Automated Knowledge Discovery in ERP Databases". 10th Industrial engineering and Management Conference.

Leist S., Winter R. 1998. "Optimal Allocation of standardized Application software Packages to Business Process steps: A Simulation based on communication and Automation Costs". International Federation for Information Processing, WG 8.2 and 8.6 Joint Working Conference on Information Systems: Current Issues and Future changes.

Lenzerini M., Nardi D., Trisolini S. M. 1999. "Conceptual Modeling for integrated Enterprise Data Management". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 67-70.

Lindvall J. 2000. "SAP/R3. Support or straitjacket for the global company?", 23th EAA Conference, March 2000, Munich, Germany.

Loo M. 2000. "IT Service Management: The IT Management ERP solution", World Class IT Service Management Guide 2000, pp. 319-326.

Loos P. 2000. "Advacnced Information Technology Application in ERP systems", Americas Conference on Information Systems (AMCIS), K., USA.

Mahrer H. 1999. "SAP R/3 Iimplementation at the ETH Zurich - A Higher Education Management Success Story?". Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Maiden N. A. M., James L., Ncube C. 1999. "Evaluating Large COTS software Packages: Why Requirements and Use Cases are Important". First Workshop on Ensuring Successful COTS Development 1999.

Markus L., Tanis C. 2000. "Enterprise systems - from Adoption to Business Value.", R. W. Zmud (Ed.), Framing the Domains of IT Research: Glimpsing the Future Through the Past, Cincinnati, OH: Pinnaflex Educational Resources Inc.

Milford M., Stewart G. 2000. "Are ERP Implementations Qualitatively Different from Other Large Systems Implementations?", Americas Conference on Information Systems (AMCIS), K, USA.

Markus M., Tanis C., Fenema P. 2000. "Multisite ERP implementations", Communications of the ACM, vol. 43, nº. 4, April 2000, pp. 42-46.

Meier M., Fülleborn A., Mertens P. 2000. "Vertical Integration of Business News from the Internet within the Scope of SAP Strategic Enterprise Management (SAP SEM)", Americas Conference on Information Systems (AMCIS), K, USA.

Mini-panel 1999. "A Research Agenda for ERP systems". Panelists: Luo Wenhong. Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Monday A. 2000. "From Grape to Glass - Are ERPs the Answer to Supply Chain Management in the Wine Industry?, 10th Annual BIT conference, Manchester, UK., November 2000.

Mylopoulos J. 1999. "Goal-oriented Analysis for Software Customization". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 375.

Niehus J. et al. 1998. "Implementing SAP R/3 at Queensland Departments of Transport and Main Roads". European Conference on Information Systems (ECIS), Aix-en-provence, France.

Noguera J. H., Watson E. F. 1999. "Effectiveness of Using Enterprise Systems to Teach Process-Centered Concepts in Business Education", Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Oliver D., Romm C. 1999. "Enterprise Resource Planning Systems: Motivations and Expectations". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 119-126.

Oliver D., Romm C. 2000. "ERP Systems: The Route to Adoption", Americas Conference on Information Systems (AMCIS), K., USA.

Panel 1998a. "Acquiring and Implementing ERP: the view from business to academia". Chair: Ton Veth. Panelists: M Lynne Markus, A. W. Scheer, Kuldeep Kumar, Hans Wortmann. International Conference on Information Systems (ICIS), Helsinki, Finland.

Panel 1998b. Panel Discussion. Gable Guy (panel chair). 9th Australasian Conference on Information Systems, Sydney, Australia.

Panel 1999a. "ERP in the MIS Curriculum: a triperspective". Panelists: Philippakis Andy, Hardway Don. Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Panel 1999b. ERP software: characteristics and consequences. Chair: Michael Rosemann. Panelists: Guy G. Gable, Gail Corbitt, Uthai Tanlamai, Klaus-Dieter Gronwald. European Conference on Information Systems (ECIS), Copenhagen, Denmark.

Park H. G. 1999. "Framework of design interface module in ERP". IEEE International Symposium on Assembly and Task Planning.

Parr A. N., Shanks G., Darke P. 1999. "Identification of Necessary Factors for successful Implementation of ERP Systems", New information technologies in organizational processes - field studies and theoretical reflections on the future of work, Kluwer academic publishers, chapter 8, pp. 99-119.

Parr A. N., Shanks G. 2000. "A Taxonomy of ERP Implementation Approaches". 33rd Hawaii International Conference on Science Systems (HICSS), Maui, Hawaii.

Pastor J., X. Franch 2000. "On the Formalisation of ERP Systems Procurement", Second Customer Off The-Shelf Software Workshop (COTS'00), 22nd International Conference on Software Engineering (ICSE'00), February 2000.

Pawlowski S., Boudreau M., Baskerville R. 1999. "Constraints and Flexibility in Enterprise Systems: A Dialectic of System and Job". Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Perez M., Rojas T., Padron J. 1999. "SAP, Change Management and Process Development Effetiveness (II): Case Study". Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Platner H. 1996. "A Standard Software Application Development SAP R/3", proceedings of the 18th international conference on software engineering, Germany, March 25-29, 1996, p. 320.

Pozzebon M. 2000. "Combining a Structuration Approach with a Behavioral-Based Model to Investigate ERP usage, Americas Conference on Information Systems (AMCIS), K., USA.

Rebstock, Michael/ Selig, Johannes G. 2000, "Development and Implementation Strategies for International ERP Software Projects", 8th European Conference on Information Systems (ECIS2000), Vol. 2, Vienna, pp. 932-936.

Riet R., Janssen W., Gruitjer P. 1998. "Security moving from Database Systems to ERP systems". 9th International Workshop on Database and Expert Systems Applications (DEXA), Vienna, Austria.

Robinson A., Dilts D. 1999. "OR & ERP: A Match for the New Millenium?",, Jun1 1999, pp. 30-35.

Ronca C. 1999. "Beyond the ERP Experience Change Management as a Key Factor a Winning Enterprise". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 373.

Rosemann M., Wiese J. 1999. "Measuring the Performance of ERP software - a Balanced Scorecard Approach". 10th Australasian Conference on Information Systems (ACIS), Wellington, New Zealand.

Rosemann M., Frink D., Uthmann Chr. Von, Friedrich M. 1999. "Workflow-based ERP: A New Approach for Efficient Order Processing". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 239-247.

Rosemann M., Chan R. 2000. "A Framework to Structure Knowledge for enterprise Systems", Americas Conference on Information Systems (AMCIS), K., USA.

Rosemann M. 2000. "Teaching Enterprise Resource Planning", Workshop, Americas Conference on Information Systems (AMCIS), K., USA.

Rosemann M., Scott J., Watson E. 2000. "Collaborative ERP Education: Experiences from a First Pilot", Americas Conference on Information Systems (AMCIS), K., USA.

Ross J. 1998. "Dow Corning Corporation: Reengineering Global Processes". International Conference on Information Systems (ICIS), Helsinki, Finland.

Ross J., Vitale M. 1998. "The ERP Revolution: surviving versus thriving", Research paper, Center for Information Systems research, Sloan School of Management, M.I.T.

Ross J. 1999. "Dow Cornings Corporation: business processes and information technology". Journal of Information Technology. vol. 14 nº. 3, pp. 253-266.

Rugg G., Eva M., Mahmood A., Rehman N., Andrews S., Davies S. 1999. "Eliciting Information about Organisational Culture via Laddering". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 299-310.

Rugg G., Krumbholz M. 1999. "Determining Culture for Effective ERP Installation". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 135-151.

Rugg G., Hooper S. 1999. "Knowing the Unknowable: The Causes and Nature of changing Requirements". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 183-192.

Sammon D., Adam F. 2000. "Towards a Model of ERP Software Selection - widening the Debate", 10th Annual BIT conference, Manchester, UK., November 2000.

Scheer A., Habermann F. 2000. "Making ERP a Success", Communications of the ACM, Vol. 43, nº. 4, April 2000, pp. 57-61.

Scott J. E., Gable G. G. 1997. "Goal Congruence, trust and organisational culture: strengthening knowledge links". International Conference on Information Systems (ICIS), Atlanta, USA.

Scott J. E. 1999a. "The FoxMeyer Drug's Bankruptcy: Was It a failure of ERP?". Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Scott J. E. 1999b. "ERP Effectiveness in the Classroom: Assessing Congruence with Theoretical Learning Models". Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Shakir M. 2000. "Decision Making in the Evaluation, Selection and implementation of ERP Systems", Americas Conference on Information Systems (AMCIS), K., USA.

Shang S. 2000. "A Comprehensive Framework for Classifying the Benefits of ERP systems", Americas Conference on Information Systems (AMCIS), K., USA.

Shaw M. J. 1999. "Web-based Enterprise Resource Planning". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 211-228.

Schönefeld M., Vering O. 2000. "Enhacing ERP-Efficiency through Workflow-Services", Americas Conference on Information Systems (AMCIS), K., USA.

Shoemaker M. E. 1999. "Introducing ERP systems to sales and marketing management graduate students: discussion and exercises using SAP R/3". 10th Annual International Information Management Association.

Sieber M. M., Nah F. H. 1999. "A Recurring Improvisational Methodology for Change Management in ERP Implementation", Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Sieber T., Siau K., Nah F. H. F., Sieber M. M. 1999. "Implementing SAP R/3 at the University of Nebraska.". International Conference on Information Systems (ICIS), Charlotte, USA.

Sistach F., Pastor J. A., Fernandez L. F. 1999. "Towards the methodological acquisition of ERP solutions for SMEs". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 35-51.

Sistach F., Pastor J. A. 2000. "Methodological Acquisition of ERP Solutions with SHERPA". World Class IT Service Management Guide 2000, edited by J. van de Bon, March 2000, pp. 225-233.

Slooten K., Yap L. 1999. "Implementing ERP Information Systems using SAP". Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Smethurst J., Kawalek P. 1999. "Structured Methodology Usage in ERP Implementation Projects: An Empirical Investigation". Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Soh C. Kien S., Tay-Yap J. 2000. "Cultural Fits and Misfits: is ERP a Universal Solution?", Communications of the ACM, vol. 43, nº. 4, April 2000, pp. 47-51.

Somers T., Nelson K., Ragowsky A. 2000. "Enterprise Resource Planning (ERP) for the Next Millenium: Development of an Integrative Framework and Implications for Research", Americas Conference on Information Systems (AMCIS), K, USA.

Sor R. 1999. "Management Reflections in relation to Enterprise Wide Systems Projects". Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Southwick R., Sawyer S. 1999. "Critical Views of organization, management, and information technology: applying critical social theory to information system research". Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Sprott D. 2000. "Enterprise resource planning: componentizing the enterprise application packages", Communications of the ACM, vol. 43, nº. 4, April 2000, pp. 63-69.

Stamper R. 1999. "Limitations of 1st generation EMRPS and How to Remove Them". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 193-209.

Stefanou C. J. 1999. "Supply Chain Management (SCM) and Organizational Key Factors for Successful Implementation of Enterprise Resource Planning (ERP) Systems". Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Stefanou C. 2000. "The Selection Process of Enterprise Resource Planning (ERP) Systems, Americas Conference on Information Systems (AMCIS), K, USA.

Stewart G. 2000. "Collaborative ERP Curriculum Developing Using Industry Process Models"", Americas Conference on Information Systems (AMCIS), K, USA.

Stewart G., Gable G., Andrews R., Rosemann M., Chan T. 1999. "Lessons from the field: A refection on teaching SAP R/3 and ERP implementation issues". Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Stewart G., Milford M., Jewels T., Hunter T., Hunter B. 2000. "Organisational Readiness for ERP Implementation", Americas Conference on Information Systems (AMCIS), K, USA.

Stijn E., Wijnhoven F. 2000. "Diagnosing Organizational Memory Mismatches in the ERP Usage Stage", Americas Conference on Information Systems (AMCIS), K., USA.

Stirna J. 1999. "Managing Enterprise Modelling Tool Acquisition Process". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 283-298.

Sumner M. 1999a. "Critical Success Factors in Enterprise Wide Information Management Systems Projects". Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Sumner M. 1999b. "Critical Success Factors in Enterprise Wide Information Management Systems Projects". Proceedings of the 1999 ACM SIGCPR conference on Computer Research, New Orleans, USA.

Sutcliffe A. 1999. "Towards a Theoretical Framework for Engineering Reusable Components". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 103-117.

Taxen L. 1999. "A Strategy for Organisational Knowledge Evolution". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy pp. 17-34.

Themistocleous M. 2000. "Taxonomy of Factors for information system application integration", Americas Conference on Information Systems (AMCIS), K., USA.

Umar A., Missier P. 1999. "A Knowledge-based Decision Support Workbench for Enterprise Resource Integration and Migration". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 53-58.

Vikram S., Vijay S., David M., Chitti G. 1999. "An Examination of Success factors for SAP Implementation". Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Volkoff O. 1999. "Using the Struturational Model of Technology to Analyze an ERP Implementation", Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Wagner G. 1999. "Agent-Oriented Enterprise and Business Process Modelling". 1º International Workshop on Enterprise Management Resource and Planning Systems (EMRPS), Venice, Italy, pp. 329-346.

Watson E., Rosemann M., Stewart G. 1999. "An Overview of Teaching and Research Using SAP R/3", Americas Conference on Information Systems (AMCIS), Milwaukee, USA.

Watson E. E., Schneider H. 1999. "Using ERP Systems in Education". Communications of the Association for Information systems (CAIS). vol. 1, article 9, Feb. 1999.

Willcocks L., Sykes R. 2000. "The Role of the IT Function", Communications of the ACM, vol. 43, nº. 4, April 2000, pp. 32-38.

Winter R. 1999. "HSG Master of Business engineering program: qualifying high potentials for IS-enabled change". 7th European Conference on Information Systems (ECIS), Copenhagen, Denmark.