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December 2007

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### Recommended Citation

Sousa, Jose, "Towards a Benefits Realization Roadmap for ERP Usage in Small and Medium-Sized Enterprises" (2007). *AMCIS 2007 Proceedings*. 130.  
<http://aisel.aisnet.org/amcis2007/130>

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# **Towards a Benefits Realization Roadmap for ERP Usage in Small and Medium-Sized Enterprises**

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## **ABSTRACT**

ERP vendors and implementers usually emphasize a positive impact of their ERP products and projects in company performance. However, the existent ERP literature and research did not attempt to establish the link between benefits of and reasons for ERP implementation, nor the attempt to determine at what point in time the various benefits are expected to materialize. Based in a pilot survey administered to a group of MBA students, we tentatively define a benefits realization roadmap for ERP usage in the context of Small and Medium Enterprises (SME). The ERP benefits roadmap suggests that a long-term vision is required in order to obtain a successful realization of the potential benefits that ERP could bring.

## **Keywords**

ERP, usage phase, company performance, benefits, roadmap.

## **INTRODUCTION**

An increasing number of Small and Medium-sized Enterprises (SME) are upgrading their legacy systems to Enterprise Resource Planning (ERP) systems. According to market research analysts META Group, ERP vendors are working harder to attract SME clients throughout and after 2004/5. Over the past couple of years, the option for the SME to integrate ERP software into its business has become a more realistic possibility in financial terms. As the business environment gets more challenging, SME are now implementing ERP packages to be more competitive, efficient and customer-friendly. However, the SME market poses some unique problems to the ERP vendors and implementers. One of the most important problems is the low level of awareness on the benefits of an end-to-end system. Awareness of the benefits an enterprise business solution could provide - irrespective of the scale of business - is the critical bridge that was missing between IT and SME. The existent ERP literature and research (Esteves and Bohoquez 2007) did not attempt to establish the link between benefits of and reasons for ERP implementation, nor the attempt to determine at what point in time the various benefits are expected to materialize. For this reason, this research-in-progress study addresses the need to understand the business benefits that SME can obtain through the ERP system implementations.

Some analysts and studies have shown that the main reason why organizations are investing in ERP solutions lays upon the overriding benefit derived from ERP investment is integration of diverse business process to simplify operations for faster decision-making. Analysts at IDC recently pointed out four key drivers, irrespective of company size: corporate growth, improved customer service, efficient distribution system and reduced operational expenses. Out of these, corporate growth is the most compelling driver. The study concluded that CEOs and other top management personnel have realized that if the organization has to survive and grow, then ERP is an effective tool that can provide better and faster information and cut costs to increase efficiency. However, the SME's perspective on ERP is somewhat different. Among the main benefits pointed out in the business literature that SME organizations are beginning to see are: significant improvements in financial processes and management, enabling more effective management of operations and optimal management of resources. A study of the Spanish ERP market conducted by Grupo Penteo (2002), shows that most of the medium and big Spanish enterprises surveyed do not use the whole functionality of their ERP systems. This aspect may affect the achievement of the expected ERP business benefits. Most of the documentation about ERP benefits has been in the form of individual case studies (e.g. Dolmetsch et al., 1998; McAfee, 1999; Gibson et al. 1999, Tagliavini, et al., 2005), while experiences on the

field show that for the segment of SME, these often fail in recognizing the economic and organizational impacts related to the use of their implemented ES. Thus, the question about the realization of the business value of ERP implementations still remains unanswered.

This exploratory study attempts to elucidate the ERP benefits realization along the ERP usage stages in SME, thus trying to define an ERP benefits realization roadmap for SME. Roadmaps are defined as views of a group of stakeholders as to how to get where they want to go to achieve desired objectives (Probert and Radner, 2003). It is an extended look at the future of a chosen field of inquiry composed of the collective knowledge and imagination of the brightest drivers of change in that field (Kostoff and Schaller, 2001; Galvin, 1998). The general roadmap is a multi-layered and time-based chart (EIRMA, 1997). But various types of roadmaps have been used, especially for technology roadmaps, and existing literature has attempted to classify them into several categories (e.g. Sandia National Laboratories classification). This article is structured as follows. First, we describe the theoretical background on ERP benefits and ERP usage lifecycle. Next, we present the methodology used. Finally, we present some conclusions and further work.

## **BACKGROUND**

### **An ERP benefits model**

Booth and Matolesy (2000) note that the commonly used analytic frameworks are not appropriate to examine the potential benefits emerging from the use of ERP systems. Thus, although the benefits claimed from ERP systems adoption have been identified (see for example Shang and Seddon, 2000; Davenport 1998, 2000) we believe that they still lack an appropriate context. Two factors identified in the literature that seem relevant for establishing an ERP benefits assessment framework are motivation for implementing the system and the point in time at which benefits are assessed. Markus and Tannis (2000) note that the benefits of ERP systems implementation should be assessed in relation to the organization unique goals for the system. Davenport (2000) states that there are different types of benefits and that some types are likely to arise before others do. For instance, benefits from improved transactional processes and common data appear to precede benefits associated with improvements in management and decision-making. Previous research (Deloitte 1999) indicated that there is a discrepancy between companies' expectations and actual achievements in their ERP implementations.

The first starting point is the identification of the ERP business benefits. Shang and Seddon (2000) created an ERP benefit list from a review of 233 ERP-vendor success stories published on the web with 34 follow-up interviews to confirm the content of their analysis. The ERP benefits found were classified into five benefit categories, namely operational, managerial, strategic, IT infrastructure and organizational (see table 1). Shang and Seddon (2000) did not attempt to establish the link between benefits of and reasons for ERP implementation, nor the attempt to determine at what point in time the various benefits are expected to materialize. We will use this ERP benefit list as the theoretical foundation for our study.

### **ERP Usage Stages**

The process of achieving additional benefits from an ERP implementation is referred to as "second wave" implementations (Deloitte 1999). Deloitte (1999) believed that there are a number of phases that occur post implementation (table 1). In the Stabilize phase companies familiarize themselves with the implementation and master the changes which occurred. The Synthesize phase is where companies seek improvements by implementing improved business processes, add complimentary solutions, and to motivate people to support the changes. The final stage, Synergize is where process optimization is achieved resulting business transformation.

Go Live	Stabilize	Synthesize	Synergize
	3-9 months	6-18 months	12-24 months

**Table 1. Deloitte second wave ERP lifecycle**

The notion of different stages of ERP implementation is reinforced by Nolan and Norton (2000) where they grouped implementations into levels of maturity. They argued that when evaluating costs of an ERP implementation, the company's previous experience with ERP systems should be considered. Their maturity classifications were: Beginning – implemented SAP in the past 12 months; Consolidating – implemented SAP between, 1 and 3 years; Mature – implemented SAP for more than 3 years. It seems reasonable to expect that companies involved in these "second wave" implementations would be either in the Consolidating or in the mature stages.

## RESEARCH METHODOLOGY

Since this study is exploratory, we opted to use an exploratory survey for the data collection. Our sample was a group of MBA students at Instituto de Empresa Business School. The main reasons to use this initial sample were the easy access to MBA students and their business experience. The number of MBA students was 48. The average age of the MBA students is 28 years old. All the students had more than 3.5 years of previous business experience and they have worked in SME. 77% of the MBA students had a management career or related. As Shang and Seddon (2000) mentioned, middle business managers are the most adequate sample to analyze ERP benefits since they used it more regularly on their daily basis and also because ERP have a more strong impact on their roles than others. Because the users attending these ERP elective sessions were targeted as respondents to the questionnaire survey, the sampling method may be described as judgment sampling or purposive sampling (Churchill 1991). In this sampling plan, sample elements are selected because they are believed to be representatives of the population of interest and are expected to serve the research purpose of this study. After the randomly selection of the MBA students, we provided them a table like the one shown in table 1, and we asked them to define for each ERP usage stage the level of benefits in realization in each stage (in percentage). Next, we added all the results and defined an average ERP benefits realization for each benefit in each ERP usage stage (see table 2). Next, we discuss the results.

## RESULTS

Table 2 displays the results of our survey, and table 3 shows the ERP benefits dimension average realization along each ERP usage stage.

Dimensions	Benefits	Stabilize	Synthesize	Synergize
Operational	Cost reduction	29	39	32
	Cycle time reduction	38,5	40,5	21,5
	Productivity improvement	29,5	46,5	24
	Quality improvement	31	42	27
	Customer services improvement	31	40	29
Managerial	Better resource management	31	43	26
	Improved decision making and planning	27	45,5	27,5
	Performance improvement	32,5	42	25,5
Strategic	Support business growth	22	43,5	35
	Support business alliance	22	34	44
	Build business innovations	16	34,5	49,5
	Build cost leadership	17	34	49
	Generate product differentiation	14,5	32	53,5
	Build external linkages	20,5	39,5	40
IT Infrastructure	Build business flexibility for current and future changes	27,5	39	33,5
	IT costs reduction	23,5	40,5	36
	Increased IT infrastructure capability	41,5	32	26,5
Organizational	Support organizational changes	38	33,5	28,5
	Facilitate business learning	26,5	42,5	31
	Empowerment	22,5	43,5	34
	Built common visions	30,5	32	37,5

**Table 2. ERP benefits along ERP usage stages**

Benefits Dimension	Stabilize	Synthesize	Synergize
Operational	32	42	27
Managerial	30	43	26
Strategic	19	36	45
IT infrastructure	31	37	32
Organizational	29	38	33

**Table 3. Benefits dimension average realization (%) by ERP usage stage**

Overall, the findings suggest that all the SAP benefits dimensions are realized in the ERP second stage – synthesize, with the exception of the strategic dimension, located in the last stage – Synergize. Next, we discuss in more detail each of these ERP benefits dimension:

- **Operational** - The findings suggest that in this dimension, almost all the benefits are reaped on the two initial ERP usage stages (almost 74% in all the cases) but mainly on the second stage, except the ‘cycle time reduction’ benefit, which has a benefit realization level higher in the first stage.
- **Managerial** - The findings suggest that in this dimension, all the managerial benefits are realized in stage one and two (more than 73% in these two stages). However, the second stage displays a significantly higher realization level.
- **Strategic** - The findings suggest that strategic benefits are realized in second and third ERP usage stages. Almost all the benefits highest realization level is in third stage, except for ‘business growth’ which is in second stage.
- **IT infrastructure** - The findings suggest that business flexibility and IT costs reduction realization is made on the second and third ERP usages stages (almost 70% of realization) but mainly in second stage, while IT infrastructure capability is realized in the first and second stages. Overall, table 2 shows that this dimension is the one that has a more similar benefits realization level among all the stages.
- **Organizational** - The findings suggest that organizational benefits are realized on the second and third stages (71%) with the second stage as the most important (38%). The only exception is ‘support organizational changes’ which has a higher benefits realization level on the first stage.

## TOWARDS AN ERP BENEFITS ROADMAP

Using the same analogy of a risk management classification matrix, we colored the dimensions with the realization level importance: red – most realized, green – realized, yellow – less realized. Table 4 shows the results.

Benefits Dimension	Stabilize	Synthesize	Synergize
Operational			
Managerial			
Strategic			
IT infrastructure			
Organizational			

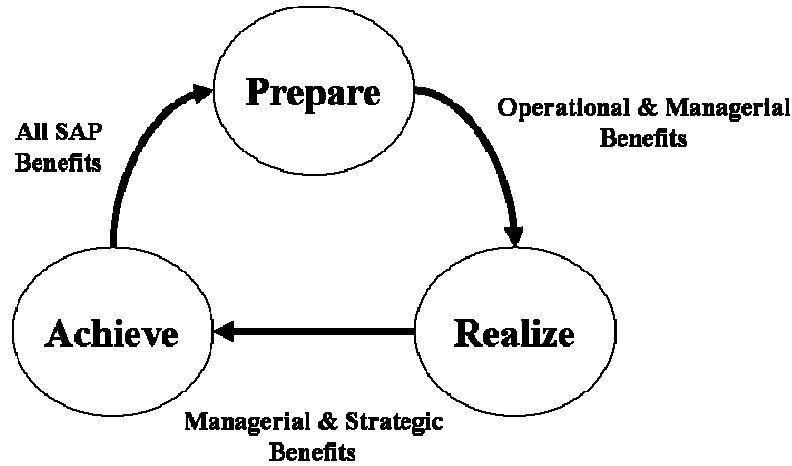
**Table 4. An ERP benefits realization level matrix by stage**

Clearly, the matrix shows that ERP usage stages two and three are the most influential ones in terms of benefits realization. However, stage one appears to be a preparatory stage to realize the benefits on the next two stages. This means that managers should expect to realize most of those benefits in these last stages. This exploratory studies show the importance of generating realistic expectations in a timely manner. A benefits management strategy will enable SME to get a real feel for the day-to-day and long-term Return On Investment (ROI) in ERP.

Based on these findings, we suggest a SAP Benefits realization roadmap (see figure 1).

### **ERP Benefits Realization Roadmap**

The process of achieving additional benefits from an ERP implementation is referred to as “second wave” implementations solutions, and to motivate people to support the changes. The final stage, Synergize is where process optimization is achieved resulting business transformation.



**Figure 1. An ERP Benefits Realization roadmap**

#### *Prepare stage*

The first stage of our roadmap concerns the activities to prepare the realization and achievement of ERP benefits. Managers should concentrate in the initiation and development of activities that will influence the next two stages. In this stage is also important to work out users expectations.

#### *Realize stage*

The second stage concerns the realization of most of the ERP benefits, especially the ones related with operational, organizational and managerial dimensions. With realization of benefits on these dimensions, managers can start showing the rest of the organization the potential of the ERP system and its impact and influence across the organization.

#### *Achieve stage*

This final stage concerns the full achievement of ERP benefits, especially the ones with a long-term vision like strategic benefits.

In our vision of ERP benefits realization, we believe is extremely important to emphasize the need to perceive ERP benefits realization as a continuum, across which managers need to constantly prepare, realize and achieve ERP benefits for the next stages. Thus, after the achieve stage, managers should go back to the beginning of the roadmap once again, in order to monitor the benefits already achieved, but also to improve such benefits.

## **CONCLUSIONS**

This research in progress study develops an exploratory benefits realization roadmap for ERP implementations in SME. The results of this study could be taken into account in order to define the marketing strategies of ERP vendors and consultants, but also in the understanding of business benefits of ERP systems and their perception from ERP stakeholder viewpoints. Overall, we think that this roadmap will help managers to improve forecasting, planning and administration of ERP benefits. The results may help to improve the understanding of ERP success and satisfaction levels, both expected and perceived from the ERP stakeholders. The next step is the validation of this roadmap through case studies in a selected sample of Spanish

SME. This study also contributes to the existent theory and practice on IS evaluation by taking into account a time perspective on benefits realization. Most of the IS benefits models are based in a static view of benefits realization.

## REFERENCES

1. Churchill, G. (1991) *Marketing Research: Methodological Foundations*, Dryden Press, Fort Worth, TX, USA.
2. Davenport, T. (1998) Putting the enterprise into the enterprise system, *Harvard Business Review*, 76, 4, 121-131.
3. Davenport, T. (2000) *Mission Critical: Realizing the Value of Enterprise Systems*, Harvard Business School Press, Boston, MA, USA.
4. Deloitte (1999) *ERPs second wave*, Deloitte Consulting.
5. Dolmetsch, R., Huber, T., Fleisch, E., and österle, H. (1998) Accelerated SAP: 4 case studies. Institute for Information Management, University of St. Gallen, Switzerland.
6. Gibson N, Holland, C. and Light, B. (1999) A case study of a fast track SAP R/3 implementation at Guilbert. *Electronic Markets*, 190–193.
7. EIRMA (1997) *Technology roadmapping: Delivering business vision*, Working group report 52, Paris, European industrial research association, www.cirma.asso.fr
8. Esteves J., Bohorquez V. (2007) An Updated ERP Systems Annotated Bibliography: 2001-2005, *Communications of AIS*, 19, 8.
9. Galvin, R. (1998) Science roadmaps, *Science* 280, 803.
10. Grupo Penteo (2002) *Aplicaciones Corporativas. Situación en España y tendencias futuras – Año 2002*, Grupo Penteo report.
11. Kostoff, R. and Schaller, R. (2001) Science and technology roadmaps, *IEEE Transactions on Engineering Management*, 18, 1, 39 - 50.
12. Markus, M. and Tanis, C. (2000) The enterprise system experience ± from adoption to success. In: Zmud, R.W. (Ed.), *Framing the Domains of IT Management: Projecting the Future Through the Past*, Cincinnati, OH, USA, Pinnaflex Educational Resources Inc., 173-207.
13. Matolcsy, Z. and Booth, P. (2000) The Impacts of Enterprise Resource Planning Systems on Accounting Practice - The Australian Experience, *Australian Accounting Review*, 10, 3, 4 - 18.
14. McAfee, A. (1999) *The Performance Impact of ERP: An Empirical Investigation*, INFORMS National Meeting, Cincinnati, OH.
15. Nolan and Norton Institute (2000) *SAP Benchmarking Report 2000*, KPMG, Melbourne.
16. Probert, D. and Radner M. (2003) Technology roadmapping, *Research Technology Management*, 46, 2, 27.
17. Shang, S. and Seddon, P. (2000) A Comprehensive Framework for Classifying the Benefits of ERP Systems. *Americas Conference on Information Systems*.
18. Stimson, J. A. (1985) Regression in Space and Time: A Statistical Essay, *American Journal of Political Sciences*, 29, 4, 914 - 947.
19. Tagliavini, M., Favaerio, P., Ravarini, A., Pigni, F. and Buonanno, G. (2005) Journal of Enterprise Information Management, *Journal of Enterprise Information Management*, 18, 4, 384 – 426.