ERP Implementation Tools for S.M.E.'s

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ERP Implementation Tools

Abstract

The investment required in ERP is very high and an inappropriate selection of ERP could prove to be a nightmare for the company. Meticulous planning is therefore required in the selection process. If we come up with the proper moves in the evaluation and selection of an ERP product, the time taken in the implementation will be less and consequently the chances of success will be greater.

ERP selection is very different from the process of purchasing off-the-shelf software such as accounting or payroll packages.

Apart from the academic point of view many vendors and consulting companies have provided implementation methodologies / tools to support the implementation process. These are useful because vendors have gained from experience, and these methodologies / tools have lived through several generations. Methodologies are now applied and used by project managers and their teams.

The aim of this article is to summarize the characteristics of the existing implementation tools and to introduce the work in progress of the author for an implementation tool for the Greek Environment and for small and medium sized companies.

Keywords: ERP Implementation, implementation toolkits

Introduction

Nowadays, organizations face the challenge of globalisation, which have led to unprecedented levels of competition. In competitive global markets, organizations need to find better business solutions, with flexible and reliable structures. Much of an enterprise's infrastructure and organization is enabled by information systems that directly or indirectly support business processes of crucial importance to growth and survival (Markus, Axline et al. 2000). By managing these processes more efficiently, competitive advantage can be gained via cost reduction, product enhancement, and customer service improvements. (Mandal and Gunasekaran 2003; Symeonidis, Kehagias et al. 2003) Global market change has become a constant, which reveals a clear and imperative need for continuously improving business processes. Since business processes are fundamental building blocks of an organization's success, information technologies that focus on process management and improve their competitive positions.

Nowadays an organization uses an information system in order to extract accurate and on time information for its needs and from what it can be viewed from figure 1 these needs are very enormous. For instance many people rely on the system to make decisions for every day work. All these needs and transactions provide data, which would be otherwise impossible to process and analyse.



Figure 1 ORGANIZATION NEEDS FOR DATA ANALYSIS

(The relationship between the different divisions is random)

Interestingly enough, a second business-driven phenomenon, enterprise resource planning (ERP) is sweeping across industry at the same time. ERP, the logical extension of the material requirements planning (MRP) systems of the 1970s and of the manufacturing resource planning (MRP II) systems of the 1980s, is now a de facto standard in industry. Two considerations make this simultaneous development very interesting. The first is that, although from a managerial decision-making perspective the two trends are quite closely linked, they seem to be evolving independently in industry.

ERP Systems differ from any other information systems, because information silos, such as Marketing, Finance, Manufacture, Distribution, HRM, etc, were being used decentralised and often with poor data transfer. This has been caused by separate applications from different vendors in different

departments. ERP systems provide a single solution from a single supplier with integrated functions for major business functions from across the value chain. (Business Information Systems, p.275)

	Database
ERP / Macola ES Raw Materials Inventory Order End	C e-Synergy HR Portal and Website Financials Financials Financials

Figure 2 ERP Concept

We can identify some of the major business processes to the following:

• Production, inclusive of the control of reserves, purchase of them, transportation costs, planning of production, planning of raw materials and maintenance of equipment and installations

• Financial Administration, inclusive of the debit and credit accounts, cash flow statements, calculation of cost of products and the preparation of the financial reporting statements

• Sales and marketing, inclusive of the process of order, pricing, debit, management and planning of sales.

• Human resources, inclusive of the management of personnel, determination of schedules, payrolls, planning and growth of personnel, supervision of sales and reports on the costs of travels.

ERP VENDORS

Some Enterprise Resource Planning Systems (ERP) Vendors are listed below (the order is random):

SAP	Oracle	Baan			
IBM	PeopleSoft - J.D. Edwards	The invensys Intelligent Automation			
AAB automation	i2 Technologies	GEAC Enterprise solutions			
Intentia	System Software Associates (SSA)	International Business Systems			
		(IBS)			
Lawson Software	Epicor Software Corp.	InterBiz Supply Chain Group			
Aspen Technology	Indus International	Honeywll Hi-spec Solutions			
Microsoft Ax-arta - Navision	Singular SA	Data Information Systems -			
		Computer Logic			
Unisoft	Et al.				

Table 1 Erp Vendors

ERP IMPLEMENTATION

ERP selection is very different from purchasing off-the-shelf software such as accounting or payroll packages. We don't need much skill to evaluate accounting software since it does not impact the business as a whole, and moreover, accounting practices are fairly standardised everywhere. Therefore, if an accounting package works for company A, there is a good chance that it will work for company B as well. But the same logic does not work with ERP. There are a number of cases where the same ERP product has been successfully implemented in company A but has failed miserably in company B. We need to analyse and examine carefully why ERP fails and therefore take the appropriate preventive measures.

Livari (livari 1991)has identified "implementation research" as one of the seven major schools of thought within IS development. Iivari notes that the "contributions of implementation research have been general insights into IS development problems rather than specific methods".

What is implementation?

Implementation is part of the process of designing a system and it is also a component of organizational change. We develop a new information system to change existing information processing procedures and often to change the organization itself. Implementation as we use the term should not be confused with a step in systems design. This definition, frequently used by IS professionals, is too narrow. Their definition generally alludes to the last phases of systems design, which we shall refer to as conversion and installation of a new system.(Lucas 1972)

The definition that this article is going to use, stresses the long term nature of implementation; it is a part of a process that begins with the very first idea of a system and the changes it will bring. Implementation terminates when the system has been successfully intergraded with the operations of the organization. The implementation process becomes more important and difficult as systems design becomes more radical.



Figure 3 ERP IMPLEMENTATION CYCLE

(Esteves and Pastor 2001)has presented a unified model of the most Critical Success Factors that affect an implementation and it is described in the figure below.



Figure 4 Erp A Critical Success Factors unified model for ERP implementation projects along ERP implementation phases, by J. Esteves

How do we know that we have successfully implemented a system? Researchers have not agreed on an absolute indicator for successful implementation (DeLone and McLean 1992; Seddon and Kiew 1994; Seddon 1997; McLean 2002; Rai, Lang et al. 2002). One appealing approach is a cost/benefit analysis.

In theory, this sounds like a good indicator but in practice it is difficult to provide meaningful estimates. To obtain the cost of an implementation is quite easy, as long as accurate book records are kept, but how can we evaluate the benefits of such an implementation.

IMPLEMENTATION STRATEGIES

The implementation of an ERP changes the way organisations do business and how people carry out their work (Koch, Slater et al. 1999). Koch has identified three major motivations for implementing ERP's and as the number of modules being implemented increases, there is a shift from a big bang to a phased approach (O'Leary 2000).

• Big bang – This approach enables organisations to cast off all their legacy systems at once and implement a single ERP system across the entire organisation. This is the most ambitious and difficult of approaches to ERP implementation.

• Franchise Strategy – This strategy, also referred to in literature as 'phased implementation' (Slater 1999), suits large or diverse companies that don't share many common processes across business units. Independent ERP systems are installed in each unit, while linking common processes. This is the most common way of implementing ERP and it allows the systems to link together only to share the information necessary for the corporation to get a performance big

picture across all the business units. "Usually these implementations begin with a demonstration or "pilot" installation in a particularly open-minded and patient business unit where the core business of the corporation will not be disrupted if something goes wrong" (Koch, Slater et al. 1999), as is the case in this research.

• Slam-dunk – With this approach, ERP dictates the process design and the focus is on just a few key business processes. This implementation strategy is most appropriate for smaller organisations.

Although a large number of papers have been recently published addressing ERP issues there is limited research concerning ERP Software evaluation, while the ex-ante evaluation of ERP systems is a strategic and a very complex activity (*Stefanou 2000*). Academic literature mainly deals with implementation issues, ignoring the way decisions are taken. (Akkermans, Bogerd et al. 2003), (*Mabert, Soni et al. 2003*)

While companies expect to improve their financial positions from ERP adoption, they may experience adverse effects. The acquisition of ERP software is not just a technical issue but also a strategic one since a typical ERP implementation is complex. Companies have faced difficulties to integrate the ERP software with the hardware, operating systems, database management systems and telecommunications suited to their organizational needs (Markus and Tanis 2000) ERP implementations require substantial investments in software and hardware, direct implementation costs, and training for system users (Davenport 2000); (*N.B. Szirbik and J.C. Wortmann 1998*)). To address this high cost and complexity, ERP Vendors developed preset software parameters based on "best practice" models within a given industry. However, this approach adds to the complexity by introducing rigidity to the implementation process often causing project delays and failures (Sauer 1993), (Woolland 2003)

ERP systems are complex software systems that confront organisations with a significant management problem. To achieve their high level of integration, ERP systems have their own internal logic of "best practice" business processes through business process reengineering (BPR) activities (Koch 2001). There have been reports that the actual ERP system does not work with the organisation that it is intended for (Gibson, Holland et al. 1999); (*Moodie 2002*)

When implementing an ERP system, the organisation needs to reconcile the technical imperatives of the system with strategic and management needs. Unlike highly customised legacy systems, ERP systems require the organisation to adapt to the software instead of modifying the software to suit the organisation's established practices. Where the organisation can successfully adapt to the software, significant gains in productivity, speed of reaction, streamlined data flows and direct access to real-time operating information may be achieved. If the organisation fails to address this imperative or its strategy does not suit the generic ERP solution, then such operating and management benefits can be elusive (Davenport 1998); (Scapens and Jazayeri 2003).

With the adoption of ERP systems, information errors are no longer confined to one area of the company, but they exist throughout the entire business. Poor information quality and inappropriate processes guarantee the passage to inefficient and ineffective management of the firm. (Lu and Gustafson 1994)

As Parr and Shanks has presented in 2000 "A taxonomy of ERP Implementation approaches" is shown in the figure below.

They have categorized the implementation process into the following matrix with the implementation categories and their characteristics respectively.

Implementation Categories

- **Comprehensive**. This category represents the most ambitious implementation approach. Typically it involves a multi-national company, which decides to implement an ERP in multiple sites, often across national boundaries. Apart from the physical scope of the project, there is an implementation of the full functionality of the ERP and occasionally this may involve the commissioning of industry specific modules. One such implementation, for example, took seven years, and the cost was measured in tens of millions of dollars.
- **Middle-road.** This category is, as the name suggests, a mid-way between a Comprehensive and a Vanilla implementation. Characteristically, there are multiple sites (although there may be only one extensive site), and a major decision is to implement a selection only of core ERP modules. Such systems may take 3-5 years to implement and cost about \$A3M.
- **Vanilla.** This is the least ambitious and least risky implementation approach. Typically, the implementation is on one site only, and the number of prospective system users is small (less than 100). A decision is made to have core ERP functionality only and to do minimal BPR in order to exploit fully the process model built in to the ERP. This decision essentially is a decision to align company processes to the ERP rather than modify the ERP to reflect unique business processes. These systems are the least complex, and typically they may be implemented in 6-12 months, and cost \$A1-2M.

Category	Physical Scope		BPR Scope		Technical Scope		Module Implementation Strategy		Resource Scope - time and budget approx.
1. Comprehensive	Single Multiple site International	x x	Alignment to ERP Local BPR International BPR	x x	 No modification to ERP (except reports and interfaces) Minor modification Major modification 	X X	Decision 1: Skeletal - core - Core/limited set Full functionality +/- industry specific modules Decision 2: Module-by-module ERP integration to legacy systems	x x x x	Time =>4 years Budget =>\$A10 M
2. Middle-road	Single Multiple site International	x	Alignment to ERP Local BPR International BPR	x x	1. No modification to ERP(except reports and interfaces) 2.Minor modification 3. Major modification	x x	Decision 1: Skeletal - core - Core/limited set Full functionality +/- industry specific modules Decision 2: Module-by-module ERP integration to legacy systems	x x x	Time =>12 months Budget = >\$A3M
3. Vanilla	Single Multiple site International	x	Alignment to ERP Local BPR International BPR	x	1. No modification to ERP(except reports and interfaces) 2.Minor modification 3. Major modification	x	Decision 1: Skeletal - core - Core/limited set Full functionality +/- industry specific modules Decision 2: Module-by-module ERP integration to legacy systems	x x x	Time = 6-12 months approx. Budget = \$1-2M

Figure 5 Parr & Shanks 2000 IEEE

Implementation Toolkits

Apart from the academic point of view many vendors and consulting companies have provided implementation methodologies to support the implementation process. These are useful because vendors have gained from experience, and these methodologies have lived through several generations. Methodologies are now applied and used by project managers and their teams.

Accelerated SAP (ASAP)

The ASAP Roadmap is a detailed project plan by SAP that describes all activities in an implementation. It includes the entire technical area to support technical project management and address things such as interfaces, data conversions and authorizations earlier than in most traditional implementations. The ASAP Roadmap consists of five phases:

- Project Preparation,
- Business Blueprint,
- Realization,
- Final Preparation and,
- Go live and support continuous change.

ASAP provides examples, checklists, or templates as samples. They are used as a starting point to avoid "reinventing the wheel." ASAP calls these things "Accelerators."

Solution Composer (SAP 2005)

SAP has developed the Solution Composer for the purpose of visualizing, planning and implementing a coherent, integrated, and comprehensive IT solution within a company. It can be used to:

- Display existing SAP Solution Maps and create new ones.
- Display existing Collaborative Business Maps and create new ones.
- Display existing SAP User Roles Maps.

The Total Solution (Ernest & Young)

Ernst & Young LLP has developed a system re-engineering approach called "The Total Solution." The Total Solution approach consists of five components:

- Phase 1 The Value Proposition: Building the business case. The key before any process can begin is to make sure it makes sound business sense.
- Phase 2 Reality Check: Assessing an organization's readiness for change. Since many people oppose change: it is something that needs to be anticipated. Status quo is easy; change is not.
- Phase 3 Aligned Approach: Setting expectations. Delivering short-term and long-term value. Short-term as well as long-term benefits are key to any project's success. Even if change is uncomfortable for some, it is easier to accept if progress is visible
- Phase 4 Success Dimension: The right blend of people, skills, methods, and management is important to the project's success. The implementation team should include people with skills in process management, change management, knowledge management, and industry skills. Teamwork is very important.
- Phase 5 Delivering Value: Measuring results and celebrating success. A project that does not show measurable results throughout the process is going to flounder. People will lose

enthusiasm and the expectations of a new way of doing business becomes just another broken promise. It would be wise to make sure that every project pays continuous "value dividends" all along the way to minimize the risk of change.

The Fast Track Workplan (Deloitte & Touche)

The Deloitte & Touche Consulting Group believes that their Fast Track implementation methodology can enhance and accelerate ERP software implementations no matter if your business objective involves global reengineering, process improvement or software replacement. The five phase Fast Track Workplan with its specific activities help achieve a rapid high-quality business transformation:

- Scoping and Planning: Project planning is initiated;
- Visioning and Targeting: Vision and targets are identified;
- Redesign: Software design and development are started;
- Configuration: Integration is planned.
- Testing and Delivery: System is delivered.

Fast Track is designed to reflect and integrate decisions regarding business redesign, organizational change and performance, training, process and systems integrity, client/server technologies and technical architecture. Fast Track identifies five areas (groups) as an individual thread to be woven into a cohesive fabric through its five phase Workplan. The areas and a list of the functions performed are as follows:

- Project Management which includes project organization, risk management, planning, monitoring, communications, budgeting, staffing, and quality assurance;
- Information Technology Architecture which includes hardware and network selection, procurement, installation, operations, software design, development, and installation;
- Process and Systems Integrity which includes security and audit control;
- Change Leadership which includes organizations design, change readiness, policies and procedures, and performance measurements;
- Training and Documentation which includes training design and delivery for project team, management, end-users, operations, and helpdesk.

The ERP Toolkit (Ovitz Taylor Gates management consulting)

This toolkit is structured to support all the people involved in ERP implementation–from the CEO and others in the executive suite to the people doing the detailed implementation work in sales, marketing, manufacturing, purchasing, logistics, finance and elsewhere.

This toolkit is not primarily about computers and software. Instead, its focus is on people–and how to provide them with superior decision-making processes for customer order fulfilment, supply chain management, financial planning, e-commerce, asset management and more. This comprehensive guide can be used as a selective reference for those, such as top management, who need only specific pieces of information or as a virtual checklist for those who can use detailed guidance every step of the way.

Enterprise Integration Toolkit

The Enterprise Integration Toolkit has been developed by the United States Assistant Deputy Under Secretary of Defence (Logistics Systems Management) to assist Program Managers, Contract Officers, and members of the Integrated Project Team in the development of a component-level architecture and the acquisition and implementation of Commercial-Off-the-Shelf (COTS) Business Systems software. It was thoroughly reviewed by The Gartner Group and Booz Allen Hamilton declaring the methodology consistent with commercial best practices and containing an abundance of tools to support the program in delivering a high quality product. Below there is an overview of the system

Enterprise Integration (EI) Toolkit Road Map Overview



Figure 6 El Toolkit US Dep. Of Defence

Conclusions

In this article the author aims at presenting the existing implementation toolkits for ERP packages. Due to the fact that an ERP selection and implementation is vital for a company, this process should be very carefully planned and this was the reason for the development of such tools. Since nowadays ERP systems are "transforming" from gigantic systems to smaller ones (eg. Microsoft Navision), vendors should consider factors for the SME's instead of the ones that existed before.

As shown earlier in the implementation stages figure 3 all of the above toolkits / roadmaps are mainly focusing on adoption decision, acquisition, implementation, use and maintenance phases, except for the *EIToolkit* and *SAP Solution composer*. This might be due to the fact that they are primarily implementation methodologies. Companies using an ERP need to take into consideration the Second Wave (Delloite Consulting) / post implementation phase because they will live with their system for the next five to ten years. They need to take into consideration the ERP lifecycle. So, ERP methodologies need to go beyond the implementation and cover the complete ERP lifecycle.

The author has identified some factors that all of the pre - mentioned toolkits do not take into consideration, that is, the size for small and medium sized countries / companies (Bernroider and Koch 2000) such as Greece, where other factors will be more important and these factors are the culture and the complexity of the economic environment, such as taxation.

There is a survey in progress trying to identify these factors, but since it is to be completed by the end of 2005 the recent results are only indicative.

The results from the in progress survey are quite interesting, while the expected gains from the preimplementation stage have changed with regard to the post implementation stage and only 30% of the respondents have evaluated the whole project before the implementation using EVA, ABC, and balanced scorecard or other.

Another interesting factor that the author has identified is the reason for Greek SME's implementing an ERP System. 50% of the Greek companies are implementing an ERP system for the capital allowance that they will gain for the E.U. and this has led to the usage of 2 I.S : the ERP and the prior system.

Vendors of ERP systems, are also entities that want to make profit, so they have developed the pre-mentioned tools for their own convenience rather than for the implementing company. This is something that can be extracted from the 50% of budget overcome of the implemented systems. These toolkits are not free for public usage and can only be obtained from the vendor.

Vendors do not bear in mind many aspects of the business cycles that a company might have and they use these tools to speed up the process of the implementation, so as to lower their preliminary cost. Afterwards when the system goes into the post implementation stage they overcharge their customers for a need that was always there but never mentioned to the customer. For instance adequate training for the user of the system.

The author is willing to provide the data of the questionnaire, a small knowledge base that will be used for a toolkit, which will consequently help the small and medium sized company with the supporting vendor deciding upon an ERP system which will be best for its needs and not just the most profitable one for the vendor.

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