

# **"ENTERPRISE RESOURCE PLANNING (ERP) SYSTEMS: KEYS TO SUCCESSFUL IMPLEMENTATION"**

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## **OVERVIEW**

As we continue to move through the 1990s, the development, use and management of information systems in enterprises will continue to undergo revolutionary changes as businesses continue to respond to aggressive competition and the need to achieve increasing levels of customer satisfaction. As we move into the 21st century, the stress on information systems and information technology organizations to deliver greater value and competitive advantage to businesses will continue to accelerate.

With the continuing increase in the amount of data that is available, the diversity in data processing applications, and the requirements for on-line processing and ad hoc querying, today's information systems are undergoing one redesign after another in order to meet the constantly changing demands on individuals and organizations to be more productive and profitable. Increasing global competition, increasing demand for quality, rapidly evolving technological changes and increasing focus on return-on-investment require dynamic, timely and flexible support from information systems if organizations are going to survive and succeed in the 21st century.

The emergence of client/server computing environments, along with the growing demand for process reengineering to address these rapidly changing business requirements, has created a demand for a new generation of enterprise business software called Enterprise Resource Planning (ERP) system. Given the tremendous pressures on businesses, the modernization of their information systems to meet these challenges will only succeed if organizations effectively develop, manage and use an Enterprise Resource Planning (ERP) system. All organizations, particularly large organizations, need an Enterprise Resource Planning (ERP) system to help ensure the effective and competitive use of their information systems, as well as the consistency, reliability, accuracy and timeliness of their business data and processes.

## **FOUNDATION FOR ERP SYSTEMS**

As indicated in the Manufacturing Systems magazine, for the last 30 years, manufacturing corporations have relied on resources planning software to create production schedules. During that same period of time, the original material requirements planning (MRP) systems evolved into manufacturing resources planning (MRP II) systems, and now into full-blown enterprise resource planning (ERP) systems, managing a much wider range of functions.

Enterprise Resource Planning (ERP) systems and enterprise-wide software packages have recently become an important driver for systems integration within companies around the world, particularly large organizations. Because of the extensive legacy infrastructure within large companies, often having completely incompatible technology systems and lacking any cohesive data and business process approach or architecture, many organizations from many different industry sectors have chosen to address their complex systems integration and technology enhancements through the acquisition of ERP software packages.

-2-

Vendors such as SAP AG from Germany; Baan from the Netherlands; Oracle, PeopleSoft and J.D. Edwards from the United States; and many more software companies from around the world have met this market challenge, in addition to the numerous ERP consulting companies providing support to companies during ERP implementation. Other smaller companies are developing niche-oriented software to help link different ERP software products, as well as link ERP software with existing applications. According to Advanced Manufacturing Research in Boston, large corporations paid over 7 billion dollars for ERP systems in 1996, with a projection of 10 billion dollars in 1997. However, these figures could be increased by a factor of ten for monies spent on ERP services and consulting. International Data Corporation in Massachusetts predicts that the most promising market for ERP systems is now in mid-sized businesses, with annual revenues between \$ 50 and 500 million dollars.

The decision to buy, versus internally build, off-the-shelf ERP solutions is based on many factors for companies including the development and implementation of client/server technologies, the breadth of existing ERP vendor functionality, embedded industry best practices, focusing on business processes and value chain concepts, scalability, centralized and decentralized options, flexibility, vendor commitment to research and development, and the necessary migration of legacy information systems to Year 2000.

Of course cost and time are inextricably linked to each of these issues. The task of replacing or rebuilding information systems on an enterprise-wide basis is extremely complex; and in many cases, organizations which have undertaken the implementation of ERP systems have seriously underestimated this complexity and the extremely critical role of factors such as human resources, corporate culture and management philosophy.

## **ERP SYSTEMS DEFINITION**

Enterprise Resource Planning (ERP) systems are developed with the primary intention to integrate as many of the business activities and/or processes within an organization as is possible. As compared to traditional systems integrators, such as Computer Sciences Corporation, Electronic Data Systems, Perot Systems, IBM Global Services, and Andersen Consulting, which provide customized information technology and processing solutions, requiring numerous system interfaces based on the specific needs of the customer, modularized ERP systems provide efficiencies and increase in productivity through the integration of information processes across the entire enterprise.

These information processes may support numerous business activities, including sales and marketing, manufacturing and production scheduling, purchasing, customer and supplier management, forecasting, human resources management, financial management, accounting, capacity scheduling, quality management, and equipment maintenance. The information enters the ERP system at one time and in one place, thus reducing the entry error rate and assuring that all parts of the organization are using the same, hopefully accurate, data.

ERP systems strongly support existing trends toward increased speed as the central competitive force for companies in the 21<sup>st</sup> century. ERP systems enable the deployment of very large quantities of business application functionality throughout the organization, in a very rapid manner, particularly if the business requirements remain within the general boundaries of the system's functionality. Overall, at this point in time, Guy Couillard and Ralph Booth from HMC International in Montreal have characterized ERP systems as:

- \* Large scale in nature providing an extensive organizational learning effort for all individuals
- \* Requiring individuals from different business functions to arrive at a consensus as to the organization's operations relative to the system framework

-3-

- \* Allocating a large amount of implementation cost to knowledge acquisition through training and consulting
- \* Requiring rapid knowledge transfer for individuals in the organization

## **ERP METHODOLOGY**

ERP systems implementation can be divided into four distinct phases: evaluation, design, deployment and enhancement. An organization must first evaluate its need for an enterprise-wide systems approach in the context of its current and future business requirements, the existing information systems environment, and future information technology strategies to support the business. Various risks, costs and benefits must be addressed. Once an executive decision is made to proceed with an ERP solution, then detailed planning and organizing begins, focusing on project scope, level of effort and required capabilities for the ERP system, along with the necessary education and training for executives and project team members.

In the design phase, detailed specifications will be developed focusing on business processes, data and information requirements and interfaces within the processes, infrastructure configuration for hardware and software, prototyping of ERP modules, and development of necessary interfaces to other applications within the organization or along the value chain with suppliers and customers as necessary. Training will continue for all individuals in the organization that will use the ERP system. In the deployment phase, the organization will implement the new ERP system, in conjunction with the ERP vendor and other necessary consulting organizations. Again, end-user training will be emphasized.

In the final phase, the organization shifts to fine tuning the ERP system, including the implementation of a dynamic performance measurement system. The human resource performance system must also be fine tuned to include establishing a continuous learning environment to ensure that all individuals within the organization are knowledgeable about the ERP system and its role in the organization.

## **CHOOSING THE RIGHT ERP SYSTEM**

Selecting the wrong ERP system can result in an unwitting commitment to an information technology architecture and technology tools that do not fit with the enterprise's overall strategic goals and its long-term technical requirements. Choosing the right ERP vendor requires the organization to address the primary question of selecting an integrated software application or a best-of-breed software application. Each type of ERP system has its strengths as well as weaknesses.

Since the selection represents a strategic decision for the organization, executives must also not succumb to quick decisions based on incomplete data because of time and cost pressures. To make effective decisions regarding the selection of the right ERP system, executives must obtain as much accurate information on the various ERP systems as possible. Since many organizations have gone down the ERP systems path over the past five years, benchmarking would be an appropriate avenue to use to help gain the required information. In addition, executives should use an in-depth evaluation methodology.

One methodology proposed by Bradley Hecht from Decision Drivers, a Gartner Group company, provides six major criteria for selecting the appropriate ERP system. The criteria include: functionality of the ERP system; technical architecture, focusing on the application environment, the user-interface capabilities, software architecture, and the available data and process models; realistic expectations for the overall cost of the ERP system; the provision of

-4-

effective long-term service and support by the ERP vendor and its consulting partners; the long-term financial well being and viability of the ERP vendor; and finally the long-term vision of the ERP vendor in terms of future modifications for the ERP system and their relationship to the existing ERP system and your future business requirements.

## **KEY ISSUES**

The deployment of ERP systems, providing distributed access to enterprise information, is a major technical and organizational challenge. Most ERP deployments represent the largest business/IT project that most companies have ever attempted. The most common complaints about ERP system implementation is that the system is too complex to install, not user friendly to use, and the organization must wait months or even years to see significant results including any appreciable return on their investment.

The amount of time to deploy an ERP system can be long and laborious, particularly if the organization does not want to stay within the general boundaries of the system's functionality, thus requiring additional customization. On the other hand, many ERP vendors early in this decade would take an all or nothing approach in marketing their ERP system to potential customers, not wanting to provide the necessary customer support to help customize the ERP system to meet the specific needs of the customer. Unfortunately, many organizations bought into this early marketing blitz by the ERP vendors, leaving them with very little flexibility in their internal operations.

Organizations also have failed to fully address the need to have all their employees, including executives, acquire new knowledge and attitudes about the ERP system, its functionality, and its operations and execution. Lack of understanding of ERP concepts and ineffective executive oversight of ERP systems implementation are more frequent and serious problems than are the technical issues. To effectively implement an ERP system, the individuals in an organization must come to agreement on a common frame of reference for the future use of data and business processes in the organization.

Derek Slater from CIO magazine has also identified five key cost areas which organizations often overlook in their evaluation of ERP systems, including training and knowledge transfer; integration with other corporate software applications, as well as testing, maintaining and upgrading the ERP system; data conversion from legacy systems to the new ERP environment, particularly a client/server environment; data analysis, particularly if ERP-related data must be combined with external data for analysis; and ERP consulting fees. A cross-functional team must assess and identify as many of these costs upfront in order to provide an accurate cost picture to the executives prior to any final decision on the ERP system.

As mentioned earlier, in deciding upon the use of an ERP system, critical issues including human resources, corporate culture and management philosophy must be fully addressed if successful implementation of the chosen ERP system is desired. Once decided and if effectively implemented, an Enterprise Resource Planning (ERP) system will provide organizations with the necessary enterprise-wide framework to build and implement standards-based data resources, applications and technologies which will fully support the organization's goals, structure, culture, control systems and processes. ERP systems permit the enterprise-wide management of resources, and the integration of sales forecasts, procurement and inventory management, manufacturing control, project management, distribution, transportation, and finance within and across business functions. ERP systems that are based on upon client/server platforms can be implemented rapidly, are flexible to accommodate changing needs and technologies, and are scalable to support an organization's growth.

With a dynamic and flexible Enterprise Resource Planning (ERP) system, organizations will be able to more effectively manage their information systems and their technology budget across the entire enterprise, providing dynamic integration, interoperability and interconnectivity. This will enhance their ability to effectively share data

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**-5-**

and transfer various software applications throughout the organization and across all technology platforms. With enhanced management and control of their information systems environment, organizations will be more successful in using their information systems to achieve competitive advantage.

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