

## ERP as a Support for the Knowledge Age

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*The current article presents the current situation of ERP(Enterprise Resource Planning) systems and the way these systems have been changing the global economic environment. The analysis is based on a set of statistical data originating from the corporate reports and specialized literature. A special attention is paid the competitive advantages induced by using ERP at a corporate level. As a result the article identifies the main benefits of ERP systems and indicates the advantages of using such systems at a corporate level.*

**Keywords:** ERP, knowledge age, knowledge economy, SAP, Oracle and Peoplesoft.

### Introduction

In the past several years, many organizations have installed Enterprise Resource Planning (ERP) systems using such packages as SAP, Peoplesoft, and Oracle. The ERP market is one of the fastest growing markets in the software industry. In research conducted by APICS, 34.5% of companies with revenues over \$1billion who were APICS members planned to purchase or upgrade an ERP system(Umble, Haft, and Umble, 2003). AMR Research predicts that the sales of ERP software will reach \$180billion by 2002(Kalling, 2003). According to one study, the ERP market may reach \$1trillionn by 2010(Bingi, Sharma, and Godla, 1999). Enterprise Resource planning systems are a major investment. Companies have invested between \$50,000 and hundreds of millions of dollars in ERP software using a variety of business justifications, including the replacement of numerous legacy systems, reduction in cycle times from order to delivery and reduction in operating cost. The on-line, real-time operational data that ERP systems provide enable managers to make better decisions and improve responsiveness to customer needs (Ross, Vatale, and Willcocks, 2003). There is evidence that organizations are satisfied with ERP. Based upon a sample of 117 firms in 17 countries, the Conference Board reports that 34% of the organizations were satisfied with ERP, 58% were somewhat satisfied, 7% were somewhat unsatisfied, and only 1% were unsatisfied (McNurling, 2001). ERP systems are the software tools used to

manage enterprise data. ERP systems help the organizations to deal with the supply chain, receiving, inventory management, customer order management, production planning, shipping, accounting, human resources management, and other business functions (Somers and Nelson, 2003).

The current article aims to present the evolution of ERP systems and the advantages they provide to companies.

### Evolution of ERPs

According to Deloitte Consulting, an ERP system is packaged business software system that allows a company to “automate and integrate the majority of its business processes; share common data and practices across the enterprise; and produce and access the information in real-time environment.” ERP systems are different from legacy systems in that organizations use ERP to integrate enterprise-wide information a supporting financial human resources manufacturing logistics and sales and marketing functions (Shanks, Seddon, and Willcocks, 2003). An ERP system provides an enterprise database where all business transactions are entered, processed, monitored and reported.

One of the most challenging issues associated with ERP systems is that the software imposes processes on the organizations that implement it. The issue of whether to make modifications or not is a significant challenge that any organization implementing ERP must face.

<b>Table 1-1: Historical evolution of ERP systems</b>			
<i>Types of Systems</i>	<i>Time</i>	<i>Purpose</i>	<i>Systems</i>
Reorder point systems	1960s	Used historical data to forecast future inventory demand; when an item falls below a predetermined level additional inventory is ordered.	Designed to manage high volume production of a few products, with constant demand; focus on cost.
Materials requirement planning (MRP) systems	1970s	Offered a demand-based approach for planning manufacture of products and ordering inventory.	Focused on marketing; emphasis on greater production integration and planning.
Manufacturing resource planning (MRP-II) systems	1980	Added capacity planning; could schedule and monitor the execution of production plans	Focus on quality; manufacturing strategy focused on process control, reduced overhead costs and detailed cost reporting.
MRP-II with manufacturing execution(MES)systems	1990s	Provide ability to adapt production schedules to meet customer's needs; provide additional feedback with respect to shop floor activities.	Focus on the ability to create and adapt new products and services on a timely basis to meet customers' specific needs.
ERP(Enterprise Resource Planning Systems)	Late 1990 and onward	Integrate manufacturing with supply chain processes across the firm; designed to integrate the firm's business processes to create a seamless information flow from suppliers, through manufacturing to distribution to the customer.	Integrates supplier manufacturing and customer data throughout the supply chain.

ERP systems impose an “integrated systems” approach by establishing a common set of applications supporting business operations. In fact, successful implementation of ERP system typically requires re-engineering business processes to better align with the ERP software (Brown and Vessey,2003; Dahlen and Elfsson, 1999). Limited customi-

zation makes it simpler to upgrade the ERP software as new versions and add-ons emerge over time. As you can see from the table 1-2; an ERP system overcomes the inefficiencies of independent systems and non-integrated data by providing integrated data to support multiple business functions.

<b>Table 1-2: Before and after ERP: Systems Stand point</b>		
	<i>Before ERP</i>	<i>After ERP</i>
Information systems	Stand-alone systems	Integrated systems
Coordination	Lack of coordination among business functions (e.g., manufacturing and sales)	Supports coordination across business functions
Databases	Non-integrated data; data having different meanings(e.g., customer);inconsistent data definitions	Integrated data; data have the same meaning across multiple functions
Maintenance	Systems are maintained on a piecemeal bases; inconsistencies result; it is costly to maintain separate legacy systems	Uniform maintenance; changes affect multiple systems
Interfaces	Difficult to manage interfaces between systems	Common interfaces across systems
Information	Redundant, inconsistent information	Consistent real-time information(e.g., about customers, vendors)
System architecture	May not be state of the art	Relies on a client-server model
Processes	Incompatible processes	Consistent business processes which are based upon an information model
Applications	Disparate applications( e.g., many different purchasing systems)	Single applications(e.g., a common purchasing system)

ERP systems are designed to provide business benefits in sales and distribution, manufacturing, costing field service and accounting. Surveys of U.S. and Swedish manufac-

turing firms show that ERP benefits include timely information, increased interaction across the enterprise and improved order management (see Table 1-4).

<b>Table 1-3: Before and after ERP: Business Stand point</b>		
	<i>Before ERP</i>	<i>With ERP</i>
Cycle time	Costly bottlenecks	Time and cost reduction of business processes
Transaction processing	Multiple transactions use multiple data files	Faster transactions using common data. Reduces the time and cost of multiple updates
Financial management	Increased cost of excess inventory, cost of overdue accounts receivable	Improves operational performance(e.g., less excess inventory, reduction in accounts receivable)
Business processes	Proliferation of fragmented processes with duplication of effort	Re-engineering around the business model that conforms with “best practices”
Productivity	Lack of responsiveness to customers and suppliers	Improvements in financial management and customer services
Supply chain management	Lack of integration	Linkages with suppliers and customers
e Business	Web-based interfaces support isolated systems and their components	Web-based interfaces are front-end to integrated systems.
Information	Lack of tactical information for effective monitoring and control of organizational resources	Allows cross-functional access to the same data for planning and control. Provides widely available information
Communications	Lack of effective communications with customers and suppliers	Facilitates organizational communications with customers and suppliers

Sources: Mabert, Sony and Venkataramanan, 2000; Olhager and Selldin, 2003

**Identifying the benefits of ERPs**

Installing ERP systems is a source of multiple advantages for a company. The fierce competition of this market has made it impossible for companies that exceed a certain

size to survive without having ERP systems. The benefits are ranked on a scale of 1 to 5 and are based on data obtained from 2 different countries (Sweden and USA)

<b>Table 1-4: Benefits of ERP</b>		
<i>ERP Performance Outcomes</i>	<i>Sweden Average*</i>	<i>U.S. Average*</i>
Quickened information response time	3.81	3.51
Increased interaction across the enterprise	3.55	3.49
Improved order management/ order cycle	3.37	3.25
Decreased financial close cycle	3.36	3.17
Improved interaction with customers	2.87	2.92
Improved on-time delivery	2.82	2.83
Improved interaction with suppliers	2.78	2.81
Reduced direct operating costs	2.74	2.32
Lowered inventory levels	2.60	2.70
* Scale : 1(not at all), to 5(a great extent)		
Sources : Mabert, Sony and Venkataramanan,2000; Olhager and Selldin, 2003		

**Conclusion**

It is undeniable that having ERP systems is a must for any company that wants to be glob-

ally competitive. In a knowledge society advantages such as: quicker access to information, increased interacting across the enter-

prise, improved on-time delivery, lowered inventory levels are key factors that make a company more powerful. Although the cost of an ERP system is not small, the experience of the last few decades has indicated that it is a highly profitable investment. We can conclude by saying that ERP systems are not an option any more, as they have become mandatory in the companies of the Knowledge Age.

### References

1. Beard, Jon W., and M. Summer. 2004. "Seeking strategic advantage in the post-net era Viewing ERP systems from the resource-based perspective." *The Journal of Strategic Information Systems* 13:129-150
2. Bingy, P., M. Sharma, and J. Godla. 1999. "Critical issues affecting ERP implementation". *Information Systems Management* 16: 7-14.
3. Brown, C. V., and I. Vessey. 2003. "Managing the next wave of enterprise systems: Leveraging lessons from ERP." *MIS Quarterly Executive* 2:65-77.
4. Dahlen, C., and J. Elfsson. 1999. "An analysis of the current and future ERP market-With a focus on Sweden." Master's Thesis. Stockholm, Sweden: The Royal Institute of Technology. <http://www.pdu.se/xjobb.pdf>.
5. Daveport, T. 2000. *Mission Critical: Recognizing the Promise of Enterprise Systems*. Cambridge: Harvard University Press.
6. Fryer, Bronwyn. Sept. 1999. "The ROI challenge." *CFO* 85-90