Enterprise Resource Planning (ERP) Systems

For Non-Practitioners

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“ERP enables companies to derive the optimum inter-operability between all parts of the organization, electronically closing the loop between the information systems that operate on each site.”

- John Wolfenden, Fourth Shift UK

WHAT IS ERP?

Enterprise resource planning (ERP) software is a group of programs and functions integrating corporate accounting and resource management with production schedules and customer orders. ERP may not be a direct focus of operations and design engineers; however, ERP is one of the most critical technological shifts an organization can make. The resulting impact of the corporate information management system is profound, such that the entire organization, even plant-floor process control, for example, must adapt to it.

ERP replaces manufacturing resource planning (MRP II), which was unable to meet the ever-changing challenges provided by the international manufacturing world. ERP is proactive (i.e., “if we get this order, which plant has the skills/capacity to handle it”) while MRP II is typically reactive (i.e., “the order rate has changed - what do we need to do to respond?”).

The term “enterprise resource planning” was coined to demonstrate the fact that these systems have evolved well beyond their origins as inventory-transaction and cost-accounting systems. The software now acts as the means to support and expedite the entire order fulfillment process. ERP can also lead to business-process reengineering. By removing barriers between functional departments and reducing duplication of effort, the systems increase flexibility and responsiveness.

The vision of ERP is evolving to include the extended enterprise. Extended ERP is an inter-enterprise vision that includes balancing and optimization of not just the enterprise, but the value network, or the entire set of supply and demand business processes that drive the enterprise’s delivery of goods and services. Extended ERP is customer focused and dynamically balanced through asset optimization and real-time transaction processing.
WHY ERP?

The primary driver in the ERP market boom has been the Year 2000 issue. As companies are faced with required system upgrades to correct Year 2000 deficiencies, many have determined it more efficient to upgrade to an ERP system at the same time. Companies figure spending $25 - $30 million on an ERP system (which is Year 2000 compliant) makes more sense than spending $20 million solely to become Year 2000 compliant. Companies are also looking towards ERP packages to upgrade their financials. ERP allows companies to link financial reporting with all other business processes.

ERP involves considerable time and expense to fully implement. Nevertheless, the companies that successfully implement ERP systems can save millions of operating dollars, and in some instances can increase production. ERP systems are enabling companies to meet today’s priorities, including guaranteed quality, lower margins throughout the supply chain, fast turnaround and rapid response. ERP flourishes when there is strong partnership between the company, its suppliers and technological providers.

Although MRP has been widely recognized as a long-term planning tool, it is often too slow and cumbersome to cope with the rapidly changing daily realities of manufacturing processes. The sophisticated advance forecasting of MRP is of little value when orders need to be turned around in a day. ERP corrects this problem by offering real time tracking activity.

In the automotive industry, for example, ERP supports electronic data interchange (EDI) enabled transactions that alert the entire supply chain to changes in any one area. A change in product scheduling by an OEM could trickle down in a real-time fashion to tier-four suppliers.

Many companies look to ERP for commonization of data. Just as car makers are trying to commonize global standards for building vehicles around the world, they are also trying to make sense out of the seemingly endless data that flows through their companies. A common system would allow the customer and supplier to speak to each other as if they were working for the same company. Anyone joining the system could potentially participate on vehicle development projects, coordinate factory scheduling, set up just-in-time parts deliveries, exchange billing information and financial data, share human resource plans and run factory planning models.

“These systems allow the auto companies to manage their supply chains and enable true just-in-time delivery. They facilitate re-engineering and remove inefficiencies and redundancies in the network. And they allow for electronic commerce” says Allen Bonde, computer industry analyst for the Yankee Group.
As noted above, the major downsides of ERP are the cost and time required to fully implement a new package. The entire process consumes millions of dollars and can last up to two or three years. Personnel from nearly all departments are typically involved in implementation and testing. Personnel must be able to adapt to a more complex system for maximum benefit.

**SUMMARY OF “THE BIG FOUR” VENDORS**

**SAP America**

- Total sales of over $2.4 billion in 1996, 31% market share in Enterprise Business Solutions, and 5th largest software vendor in the world
- 1,700 E&Y MC personnel generated revenues of $300 million in 1996
- 9000+ employees, 6,000+ customers and worldwide presence in over 50 countries
- 6 out of the top 10 Fortune 500 companies use SAP

**SAP Strengths**

- Technology leader with largest R&D budget by far
- Knowledge of business
- Multi-language, multi-currency, multi-company
- Highly integrated business processes - within the enterprise, across the enterprise, and leveraging the Internet
- Continuous business process innovation
- Marketing ability
- Relatively strong manufacturing component

**SAP Weaknesses**

- Difficult to implement (high-risk, complex, long)
- Cost
- Inflexible
- High turnover of experienced customer project staff
- Human resources well versed in SAP (in all consulting firms).
SAP Outlook

SAP was hardly known for 20 years until it introduced its R/3 product in 1993. R/3 was the first three-tiered, client/server ERP software to hit the market. This breakthrough placed SAP at the forefront, and the rest of the market has been playing catch-up ever since. However, recurring stories about the difficulty to fully implement R/3 has prompted SAP to simplify the process of installing R/3.

In order to accomplish this goal, SAP has developed a program called ASAP, or Accelerated SAP, to manage the process. ASAP was developed from proven methodologies for organizing all the people, projects, and software involved in R/3 installation. Incorporated software is expected to allow for swift reconfiguration of various R/3 models to address the needs of specific businesses.

SAP will soon launch several other initiatives geared toward making products more customer focused. Programs include broadening of electronic commerce and Internet capabilities, and expansion of R/3’s supply-chain management functions. SAP plans to utilize professionals from its 15 SAP Centers of Excellence throughout North America to work with customers in various industries and develop solutions for their specific business needs.

SAP is looking for new arenas to conquer, specifically the market for mid-sized manufacturers. Christopher Burton, SAP’s director of product marketing, notes “Quite simply, there are a huge amount of potential customers in the midrange market. We recognize that they have somewhat smaller budgets and a need for quicker implementations. But we also think we now have solutions to meet their needs.”

Oracle

- Total sales of over $700 million in 1996
- Deep product offerings - 35 modules cover all facets of enterprise computing (from manufacturing to human resources to sales force automation)
- 430 E&Y MC personnel generated revenues of $36 million in 1996

Oracle Strengths

- Excellent financials functionality
- Leader in web-based applications
• Successful implementations led by well-trained Oracle consultants, industry experts
• Industry solutions vision through “Best of Breed” strategy (alliances vs. R&D)
• Global market presence
• Advanced database technology
• Scalability (i.e. across divisions)
• Flexibility

Oracle Weaknesses

• Contention between Oracle services and major systems integrators
• Often complex business relationships with system integrators
• Operates on one database
• HR product suite still maturing

Oracle Outlook

Oracle recently announced the first of its own line of robust supply-chain products, in addition to unveiling the general availability of all of its applications on the Windows NT platform. Oracle anticipates the Windows announcement will increase market share among mid-sized manufacturers.

Oracle developed its new supply chain modules - Oracle Supply Chain Planning, Oracle Supplier Scheduling, and Oracle Product Configurator - to enhance manufacturing companies’ customer service via integrated, networked supply chains. As is the case with all other Oracle applications, these modules run on numerous computing platforms, including the World Wide Web.

Kerry Lamson, a company vice president, explains how these modules are just another way in which Oracle makes it possible for manufacturing and distribution companies to utilize technology for competitive advantage: “The addition of these modules to our already extensive supply-chain solutions will help customers extend their supply chain throughout the enterprise, and beyond. Now, they truly can include customers and suppliers as part of their supply chain.”

Oracle also plans to grow Oracle Consulting while strengthening relationships with leading services firms, especially for larger enterprise-wide projects and middle-market clients.

PeopleSoft
• Total sales of $450m in 1996; 111% growth over last 5 years
• Over 1400 customers worldwide
• Product philosophies: Enterprise-ready; built for people; designed for change; customer driven
• Recently became major player in ERP market, rising to top tier of vendors, having already established strong base of HR, financial, and distribution applications
• Approach to advanced planning technology has redefined ERP

PeopleSoft Strengths:

• Flexibility and ease of modifications
• Shorter implementation cycle and integrated workflow
• Recognized HR leader and strong Financial position
• Focus on customer service
• Strong customer base - in survey of 700 customers, 99% would buy again
• Growing Big 6 support
• Innovative
• Red Pepper acquisition

PeopleSoft Weaknesses

• Manufacturing product is new
• No process manufacturing support
• Managing fast growth
• Uncertain scalability
• Not significantly recognized in market (outside HR)

Peoplesoft Outlook

The company’s recent acquisition of advanced planning vendor Red Pepper Software has helped set the standard for the ERP market, as other companies race to secure supply-chain planning technology. The Red Pepper integration, as well as other alliances with other 3rd party on-line analytical processing (OLAP) vendors, also pose challenges to the company as it expands its base from HR and Financials to ERP.

Some planned future enhancements/additions in the works are Internet ready and web-based self service applications, a wider global functionality, and the addition of demand forecasting and transportation planning modules.
Baan

- Total sales of $388m in 1996; successful public offering in 1995
- 2200 customers worldwide; sales/distribution centers in over 40 countries
- Supports client/server architecture

Baan Strengths:

- Strong manufacturing presence
- Open system architecture: database-independent; user interface-independent; operating system-independent; multi-platform
- Configurable and scaleable
- Accelerated time-to-implement, teaming model
- Orgware positioning (direct linkage of process models to application modules)

Baan Weaknesses:

- Focus of organization
- Service/support
- R&D expenditures
- Difficult to implement

Baan Outlook

Baan’s third-party alliances and customer and quality initiatives reflect its strong desire to be a dominant force in the worldwide enterprise software market. The recent alliance with Hyperion Software will build up its financial applications, while the company’s acquisition of Aurum Software will strengthen the sales and customer service pieces of its applications suite.

The company launched an aerospace and defense industry marketing initiative, bringing a former Boeing executive on board as executive vice president of customer initiatives. Baan is also pursuing mid-sized manufacturing companies, having recently announced that its Baan IV ERP suite is now compatible with Microsoft’s BackOffice, which uses Windows NT and SQL Server.

Baan has also formed its own Web strategy, with the development of a Java-based Web browser for all current applications, and creation of stand-alone Web solutions that can run on any ERP suite. The company has introduced its first Web-based product, a suite of supply-chain functions that include a Web-enabled sales configurator.
SUCCESS STORY

*Shared Services SAP Implementation - Auto Parts Manufacturer*

Cost pressures in the automotive industry drove an E&Y client to consider implementing shared services for financial transactions. In the prior phase of work, E&Y assisted with the selection of the software package, SAP.

We were engaged due to our combined expertise in shared services implementations and SAP software implementations. We reduced the client's risk of failure and reduced the client's expected cycle time to implement.

While the client chose not to share the internally developed shared services value statement for competitive purposes, it acknowledged that the savings were estimated to be $35 million over a five year period.

*More ERP Endorsements:*

> “Ultimately, a centralized (ERP) database will provide more timely access to data, and improve human resources related services for our 700,000 associates throughout our operations worldwide.”

- Ton Puckett, Director of Information Systems, Wal-Mart

> “PeopleSoft’s global enterprise solution was the best for both our technological and our functional needs. Its ability to model our structure and business processes graphically, as well as its powerful development tools and Year 2000 compliance, convinced us.”

- Sergio Ferreira Dias, Carrefour

TRENDS IN ERP MARKETPLACE/OUTLOOK FOR FUTURE

Since 1991, ERP application vendors have experienced phenomenal growth: total revenue, including license, maintenance, and service fees, has jumped from less than $200m to almost $11.5b in 1996. ERP license revenue alone in 1996 was $6.21b.
While the days of 100%-plus growth are gone, the market will continue to expand at a rate of 30% - 40%. This healthy growth rate is expected to continue into the next century, with some analysts predicting total revenue of over $32b in year 2000. Maintenance fees will command a larger percentage of total revenue, with growth in new license fees dropping from over 30% to less than 10%. Those vendors with mature global sales and support networks will experience the highest growth, while a variety of converging factors will cause many ERP vendors to experience flattened sales.

Due to the slowdown in growth, stronger competition among vendors, and the near commodity status of ERP packages, average selling prices for basic transaction functionality is expected to decrease 50% during the next three years.

**Historical Market Segmentation Disintegrating**

Market segmentation will evaporate as high-end vendors exhaust opportunities at the largest companies and move downstream to invade small to mid-sized operations, traditionally the mainstay of middle-market vendors such as J.D. Edwards and SSA. By year 2000, the middle market will represent the same total market opportunity as the over $1b segment.

**Consolidation of ERP Market**

As a result of the increased focus of high-end vendors on mining the middle market, many smaller vendors will be forced to consolidate or fold. Some analysts predict that up to 60% of today’s ERP vendors will not survive the next 5 years. The fallout will not escape larger vendors as well, with some predicting a 30% reduction in high-end vendors by year 2000 and only a handful surviving which cater to the largest Fortune 500 companies.

**Industry-Specific Solutions Driving Future Market**

By year 2000, the rise of specialized vertical solutions will have a major impact on the ERP market. Users will increasingly align with vendors delivering deep industry-specific functionality, acquired through internal development efforts or partnerships with third-party vendors.

**Focus on Components/’Bolt-On’ Packages**

One or more large vendors will strive to establish the de facto standard for the industry, by controlling the component interfaces on which all other vendors depend. Other vendors will be forced to follow their lead. Many vendors, for example, are ‘bolting-on’ supply chain, warehouse management and engineering packages to their backbone packages.
Specialized vertical solutions with open component architecture will give users more control and flexibility. At the same time, enterprise-wide implementations will be less commonplace, and focused, quicker implementations will prevail which meet the increased demand for agility, simplicity, and customer focus.

*Making ERP Easy*

Approximately 44% of Fortune 1000 companies which implemented ERP applications estimated they spent at least four times as much on implementation help - like systems integrators and the Big Six consulting firms - as they spent on the software license itself. As such, most ERP vendors are looking for ways to speed implementations. The ease of implementation is important for all manufacturers, but even more so for small to mid sized manufacturers. Implementations need to become considerably cheaper as well.

**CONCLUSION**

Driven primarily by Year 2000 compliance issues, most manufacturers have either taken the plunge into ERP or are investigating its possibilities. ERP’s impact on manufacturer supply chains, customer service, and information management is constantly growing. The entire market has experienced incredible growth and is evolving to meet customer demands. The next step in this evolution is the emergence of ‘bolt-on’ packages to original ERP.

These new, more complete ERP packages are expected to be cheaper and easier to implement. The shortage of human resources, however, is a problem which must be addressed to continue the growth in the marketplace.
BIBLIOGRAPHY