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Academy Of Economic Studies - Bucharest

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Enterprise Resource Planning (ERP)

By: Professor Vasile AVRAM, PhD

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Chapter 6: Enterprise Resource Planning (ERP)

6.1 Definition

Enterprise Resource Planning (ERP) can be defined as: *“A system used to integrate the informational processes of a single organization. It is a set of software modules that automates transactions by sharing a common database. It allows real-time access to the processes of a firm and eliminates redundancy.”*

Enterprise Resource Planning (ERP) systems may include and link together everything from manufacturing, financial, accounts receivable and payable, general ledger, purchasing, order entry, warehousing, transportation, and human resources. Generally, these systems combine all business processes in a single application, store all data in a single database, and provide a single interface across the entire enterprise. ERP systems are written by software vendors and are most commonly found in large companies. Companies can buy a complete ERP system from a single vendor, such as SAP or Oracle, or can choose different applications from different vendors (“best-of-breed”). The first major vendors of ERP solutions represented by SAP, Oracle, [PeopleSoft, JD Edwards], SSA Global [SSA, Baan, Marcam], JBA, Intentionia, QAD etc.

The ideal vision of ERP is *single-instance* solution, meaning a single application and one giant database that serve all of an enterprise's needs. Recent advances in storage and server devices, increased networking speeds, and communications bandwidth makes the idea of a single ERP system more plausible today than it may have seemed in the past. Advantages of a single-instance solution include:

- Streamlined financial reporting due to one application tracking cost and revenue company wide;
- Cost control and reduced staffing normally required to manage disparate applications;
- Competitive advantage gained by allowing a focus on core business activities.

As attractive as a single-instance ERP system may sound, it may not be cost-effective or practical to replace existing systems with one brand-new solution. In these cases, an integration approach using XML-based tools or emerging web services best-of-breed approach. The advantages of an integrated, best-of-breed approach to ERP include:

- **Ability to leverage** substantial investments in existing software and systems
- **Better functionality** for specific applications by allowing the use of specialized software
- **Flexibility to participate** in collaborative efforts with others, regardless of the ERP system they use.

Smaller scale options for optimizing business functions are available, but ERP and SCM are two examples of enterprise-wide solutions for streamlining product development and business processes.

Installing an ERP system is a major undertaking and requires many specialized people. Because of the additional analysis and design work required in converting a company's internal systems to the new one, consultants specializing in the specific ERP package are needed through the installation.

Using ERP systems requires both application and technical developers. With any ERP system, most companies start by installing accounting systems, then human resources and payroll. Financial systems usually follow and front-office systems are the last to be installed.

For manufacturing companies, the manufacturing systems can be implemented any place in the order and, in fact, are often implemented first.

The single vendor framework works best when highly integrated manufacturing or distribution processes are necessary and makes sense if a company is following a re-engineering strategy.

The best-of-breed approach obviously is more flexible and can take advantage of software already in place. It does require more attention and support because interfaces must be built to integrate the software from different vendors, but has been the norm for service-oriented businesses like financial services where the interfaces between functions are more standardized.

6.2 Solution Types for Enterprise Resource Planning

Enterprise Resource Planning (ERP) is a method for integrating the resources of multiple department levels into a single computer system. ERP ensure integration of the enterprise at the operational and tactical levels of management. ERP enables the integration of data and business processes throughout an organization. Modern ERP solutions are supported by new technologies in information processing and networking. Internet technology has brought in further capabilities to the ERP and has made decision making possible at lower levels of management.

By integrating business functions, ERP solution gives several benefits to the organization, including the few mentioned here:

- A single system to support rather than several small and different systems
- A single applications architecture with limited interfaces
- Access to management information unavailable across a mix of applications
- Access to best practice systems and procedures
- More integration hence lower costs
- More automation of tasks
- Increased flexibility
- Reduction of lead time
- Better customer satisfaction
- Improved performance
- Improved resource utility

While ERP offers many potential advantages, it is not a one-size-fits-all solution. Any one of three basic types can be used, depending on the nature and size of your company, and its stage of growth:

1. Single-instance - requires a company to jettison fragmented legacy applications to unite under one broad-based system. Smaller companies may find this practical; so large an effort can take time to implement for a big corporation that will feel the ramifications for months, or even years, to come. The complexities of a global operation may completely bar single-instance ERP as a feasible solution. But where it does work, the advantages are considerable.

2. Franchising strategy - maintains a company wide link between common processes. Other ERP functions are conducted independently. This works well for large and varied companies where ERP use on a universal level has limited application.

3. Focus on key processes - is often used by companies undergoing growth. For example, a start-up manufacturing company that wants to get ERP running quickly can decide to link a few activities for the time being, while leaving others for future expansion. Starting small also allows more established companies to put some modules into effect, while using these observations to predict the difficulties of a larger effort.

To bring sundry resources together in one workable format is a difficult mission for any IT department. Before replacing old, familiar systems with new ones that don't reflect the company's true nature, be sure you've considered all the options to make the best ERP decision.

ERP provides the raw material — data — which can be accessed using a single application from all kinds of business functions including the following:

- Finance; -Treasury; - HRM; - Enterprise controlling; - Investment management; - Production planning; - Manufacturing and production planning; - Sales and distribution; - Plant maintenance; - Quality management; - Materials management; - Project management; - Supply chain management; - Front office; - Performance measurement; - Service management; - Procurement management; - Payroll; - Utility.

The new generation of ERP solutions provides interfaces to related technologies such as the following:

- Business process reengineering (BPR)
- Decision support systems (DSS)
- Executive information systems (EIS)
- Data warehousing
- Data mining
- Analytic intelligence
- Online analytical processing (OLAP)
- Supply chain management (SCM)
- Customer relationship management (CRM)
- Balanced scorecard
- Value chain
- Activity-based management
- Human capital management (HCM)
- Operations management
- Knowledge management
- Risk management

6.3 SAP ERP: SAP's Core Product

SAP ERP is an online transaction processing (OLTP) system that includes at a high level finance, logistics, human resource management, customer service, and quite a few others. The SAP ERP evolution can be summarized as depicted in figure 6.1.

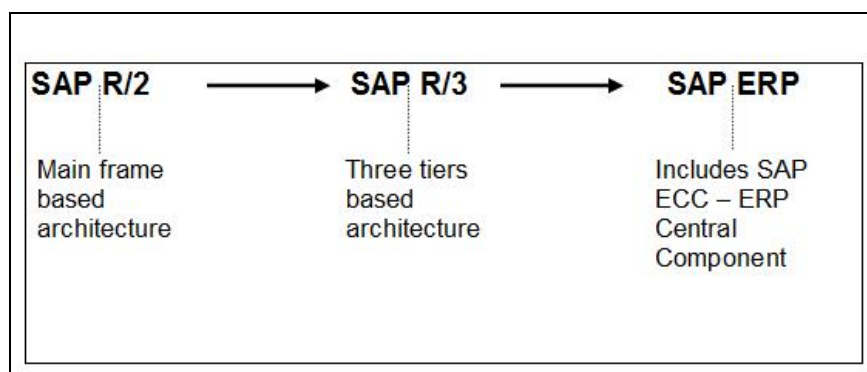


Figure 6.1 The SAP evolution

The comparison of SAP ERP with his ancestor SAP R/3 can be defined as more:

- **Extensible and powerful** due to the adoption of open Internet and Web Services standards alongside Microsoft .NET and J2EE interoperability;
- **Adaptable and agile** due to adoption of Services-Oriented Architecture and the leverage of his web-based computing platform.

SAP ERP composed of many modules, often referred to as business modules. By combining business modules (and perhaps other SAP technologies or components), SAP enables an organization to create the specific business solutions. With SAP's architecture, a company deploying SAP ERP need not completely develop each module within its implementation.

SAP ERP includes numerous functional enhancements (more than 300) for better addressing an organization's finance, HCM, operations, and vital corporate services functions. SAP ERP allows to quickly deploy scenarios or SAP-customized solutions and each of which that is geared toward supporting essential business functions such as the following:

- **SAP ERP Financials** - Provides built-in compliance for Sarbanes-Oxley and Basel II, which takes financial reporting and corporate governance to another level.
- **SAP ERP Operations** - Composed of Procurement and Logistics Execution, Product Development and Manufacturing, and Sales and Service. These solutions take logistics to the next level, introducing sales, warehousing, procurement, transportation, and distribution into the realm of collaborative business solutions. By extending these core business processes to include customers and suppliers, and enabling employees with Portal and even mobile access, ECC is truly at the core of a solution.
- **SAP ERP Human Capital Management (HCM)** - Transforms an HR department into an organization well equipped to manage and retain the core of any successful business—its people. HCM pushes HR business processes out to the Web, enabling long-time mainstays of HR organizations such as recruiting, e-learning, and employee self-services to change and evolve with much greater velocity and agility than its predecessors. In this, SAP ERP HCM maximizes workforce potential.
- **SAP ERP Corporate Services** - Wraps up a set of core services into a neat package. Processes ranging from Project and Portfolio Management to Environment, Health, and Safety (EH&S) Management, Real Estate Management, Travel Management, and Quality Management are unified and streamlined like never before possible.
- **SAP ERP Analytics** - A targeted and robust solution, marrying financial, operations, and workforce-based analytics and reporting. Supports the entire lifecycle of upport management.

6.3.1 SAP ERP Financials

SAP ERP Financials enables governance, helps manage risk and compliance, increases inventory turns, frees up cash and working capital, provides greater financial transparency, and simplifies other complex invoicing and payment processes. The ability to drill down into areas such as profitability analysis and take advantage of built-in analytic solutions empower end users as they make better decisions faster across many different financial domains and, therefore, address financial matters like the following:

- **Governance, Risk, and Compliance (GRC)** - provide the kind of visibility and transparency that organizations demand in response to various regulatory body and internal control requirements;

- **Financial and Managerial Accounting** - provides an end user the ability to enhance companywide strategic decision-making processes. It allows companies to centrally manage financial accounting data within an international framework of multiple companies, languages, currencies, and charts of accounts. The Financial and Managerial Accounting module complies with international accounting standards, such as GAAP and IAS, and helps fulfill the local legal requirements of many countries, reflecting fully the legal and accounting changes resulting from Sarbanes-Oxley legislation, European market and currency unification, and more;
- **Controlling (financial controls and audit support)** - provides the functions necessary for effective and accurate internal cost accounting management;
- **Enterprise Controlling** – assist in creating high-level enterprise plans that allow for the adaptable representation of customer-specific plans and their interrelationships; analyze the profitability of internal responsibility or profit centers; provides up-to-the-minute overview of the critical information required in order for your company to effectively manage its resources;
- **Treasury Management** - offers the functionality that a company needs to control liquidity management, risk management and assessment, and position management;
- **Global Trade Services (GTS)** - makes it possible for international companies to connect and communicate with various government systems using a companywide trade process spanning SAP both internally and externally. GTS ensures that the company meets international regulatory requirements and manages global trade by integrating companywide trade compliance across financial, supply chain, and HCM business processes. Facilitate and expedite the import/export process for goods traveling through different country customs organizations and facilitate increased supply chain transparency by sharing cross-border trade-related information with partners (from insurance entities to freight handlers, banking institutions, and regulatory bodies);
- **Financial Supply Chain Management (FSCM)** - streamline supply chains from a financial perspective by giving an organization the following functionalities:
 - Credit Limit Management and Control;
 - Credit Rules Automation;
 - Credit Decision Support;
 - Collections Management;
 - In-House Cash Management;
 - Dispute Management;
 - Electronic Bill Presentment and Payment;
 - Treasury and Risk Management.

6.3.2 SAP ERP Human Capital Management

In the 1990s, SAP made the strategic decision to incorporate human resource management, or what it has termed Human Capital Management (HCM), into its core OLTP system. In HCM, SAP has pulled together a robust collection of integrated and self-described "talent management" capabilities. HCM improves organizational insight into the talents of the firm, provides hiring and ongoing training support. And because the system reflects the languages, currencies, and regulatory requirements of more than 30 different countries, HCM can be deployed by global firms seeking to adopt both a comprehensive and a consistent method of managing its people.

SAP HCM also facilitates an HR shared services center augmented by reporting and analytics capabilities. In this way, HCM marries what the organization needs to measure

internally (related to how well its own HR teams are performing against targets and other metrics such as hiring goals, for example) with the organization's services to its customers—the firm's employees, long-term contractors, and others. This self-service functionality includes or supports a number of roles and company needs, including the following:

- A centralized employee interaction mechanism; Employee Self-Service (ESS);
- Workforce process management; Manager Self-Service (MSS);
- Workforce deployment.

SAP ERP HCM is ideal for HR organizations seeking to best manage and retain their people:

- HCM is integrated into other business processes by virtue of its connection with SAP ERP Financials, Manufacturing, and so on.
- World-class enterprisewide talent management functionality gives an organization the ability to proactively manage its most precious assets—its people.
- HCM gives leadership and line managers alike the ability to enable and empower the global team.
- The ability to connect a firm's workforce to a single system of record and accountability facilitates smooth internal transfers and other career development activities around the world.
- HCM's built-in business intelligence capabilities provide powerful companywide HR reporting.
- The ability to run SAP ERP HCM as an outsourced business process (also called Business Process Outsourcing, or BPO) gives HR organizations a choice.
- SAP's extensive partner network helps ensure supportability.
- SAP ERP HCM's superior technology platform and functionality not only are inherently innovative, but invite further innovation through easy integration, extended business processes, and computing platform choice.

6.3.3 SAP Manufacturing and ERP Operations

SAP ERP provides several solutions that assist firms in achieving operational excellence through process efficiencies, business agility, and streamlined business operations. Essentially logistics, these solutions encompass all processes related to a firm's purchasing, plant maintenance, sales and distribution, manufacturing, materials management, warehousing, engineering, and construction. SAP Manufacturing and SAP ERP Operations (an aging but still useful term) include the following solutions:

- Procurement and logistics execution, allowing end users to manage their end-to-end procurement and logistics business processes as well as optimizing the physical flow of materials
- Product development and manufacturing, from production planning to manufacturing, shop floor integration, product development, and so on
- Sales and service, which range from actual sales to managing the delivery of services and all the processes necessary to pay out commissions and other sales incentives

SAP Manufacturing's goal is to fully connect a firm's manufacturing processes with the rest of its business functions: logistics, financials, EH&S requirements, and more.

SAP Manufacturing allows a company to transform itself through enhanced manufacturing capabilities like the following:

- SAP Lean Planning and Operations— Useful for accelerating and maintaining lean operations (through high throughput, high quality, and low overhead)

- SAP Manufacturing Integration and Intelligence— Essentially the data that a manufacturing team needs to take the proper action at the proper time
- SAP Supply Chain Management— Enables the kind of supply chain optimization that brings together and empowers the team
- SAP Solutions for RFID— A set of customized solutions that help optimize supply chains through more efficient asset tracking and management
- SAP ERP Operations— Enables the manufacturing team to gain greater visibility into its operations and in turn increase control and business insight

Within SAP ERP Operations, the focus of SAP's Production Planning and Control module is to facilitate complete solutions for the following:

- Production planning
- Production execution
- Production control

Materials Management

Materials Management components include the following:

- Inventory Management
- Warehouse Management
- Purchasing
- Invoice Verification
- Materials Planning
- Purchasing Information System

Plant Maintenance

The main benefit to SAP's Plant Maintenance module is its flexibility to work with different types of companies to meet differing designs, requirements, and work forces. The Plant Maintenance module also contains a graphical interface, which makes it very user friendly and enables it to cater to a larger population of your work force. Different management strategies are supported within the application (including Risk Based Maintenance and Total Productive Maintenance). Components of Plant Maintenance include the following:

- Preventative Maintenance
- Service Management
- Maintenance Order Management
- Maintenance Projects
- Equipment and Technical Objects
- Plant Maintenance Information System

Sales and Distribution

Sales and Distribution module, which enables sales and services, arms a firm with the necessary instruments to sell and manage the sales process.

6.3.4 SAP ERP Corporate Services

The final SAP ERP business solution, Corporate Services, assists companies with streamlining internal lifecycle processes. Modules of Corporate Services include the following:

- Global Trade Services (GTS)— Intended to manage international trade activity complexities, from regulatory compliance to customs and risk management. (GTS was discussed in much more detail earlier this hour.)

- Environment, Health and Safety (EH&S)— EH&S compliance and occupational health management is intended to assist firms with managing how they comply with matters of product safety, hazardous substance management, waste and emissions management, and so on.
- Quality management— Reflects the controls and gates necessary to proactively manage the product lifecycle.
- Real estate management— Used to manage the real estate portfolio lifecycle, from property acquisition through building operations, reporting, maintenance, and disposal.
- Enterprise asset management— Addresses design, build, operations, and disposal phases.
- Project and portfolio management— Used to manage a firm's project portfolio (including tracking and managing budget, scheduling, and other resource-based key performance indicators).
- Travel management— Ranges from processing travel requests to managing planning, reservation changes, expense management, and specialized reporting/analytics.

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