Enterprise Resource Planning:

Enterprise resource planning (ERP) is business management software—usually a suite of integrated applications—that a company can use to collect, store, manage and interpret data from many business activities, including:

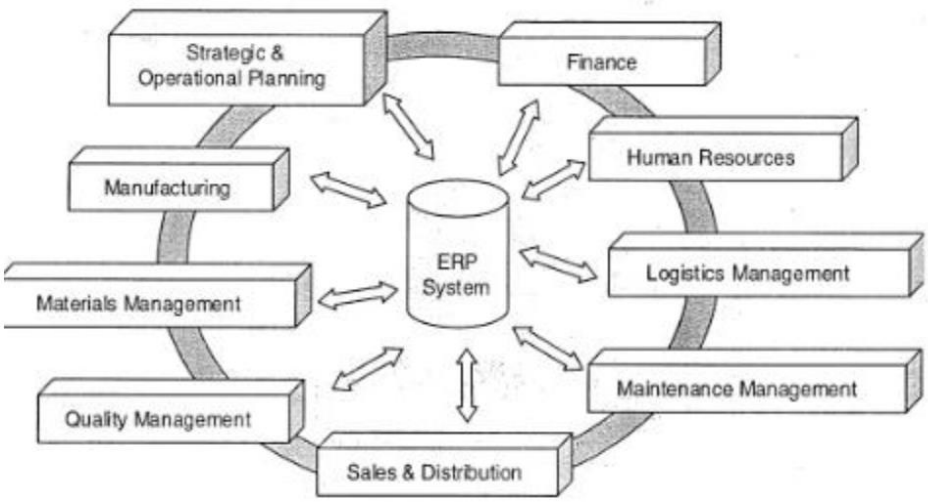
- Product planning, cost
- Manufacturing or service delivery
- Marketing and sales
- Inventory management
- Shipping and payment

- ERP provides an integrated view of core business processes, often in real-time, using common databases maintained by a database management system. ERP systems track business resources—cash, raw materials, production capacity—and the status of business commitments: orders, purchase orders, and payroll. The applications that make up the system share data across the various departments that provide the data. ERP facilitates information flow between all business functions, and manages connections to outside stakeholders.
- Enterprise system software is a multi-billion dollar industry that produces components that support a variety of business functions. IT investments have become the largest category of capital expenditure in United States-based businesses over the past decade. Though early ERP systems focused on large enterprises, smaller enterprises increasingly use ERP systems.
- The ERP system is considered a vital organizational tool because it integrates varied organizational systems and facilitates error-free transactions and production. However, ERP system development is different from traditional systems development.
- ERP systems run on a variety of computer hardware and network configurations, typically using a database as an information repository.

Functional areas of ERP:

An ERP system covers the following common functional areas. In many ERP systems these are called and grouped together as *ERP modules*:

- Financial accounting: General ledger, fixed asset, payables including vouchering, matching and payment, receivables cash application and collections, cash management, financial consolidation
- Management accounting: Budgeting, costing, cost management, activity based costing
- Human resources: Recruiting, training, rostering, payroll, benefits, 401K, diversity management, retirement, separation
- Manufacturing: Engineering, bill of materials, work orders, scheduling, capacity, workflow management, quality control, manufacturing process, manufacturing projects, manufacturing flow, product life cycle management
- Order Processing: Order to cash, order entry, credit checking, pricing, available to promise, inventory, shipping, sales analysis and reporting, sales commissioning.
- Supply chain management: Supply chain planning, supplier scheduling, product configurator, order to cash, purchasing, inventory, claim processing, warehousing (receiving, putaway, picking and packing).
- Project management: Project planning, resource planning, project costing, work breakdown structure, billing, time and expense, performance units, activity management
- Customer relationship management: Sales and marketing, commissions, service, customer contact, call center support - CRM systems are not always considered part of ERP systems but rather Business Support systems (BSS).
- Data services : Various "self–service" interfaces for customers, suppliers and/or employees.



Benefits of ERP:

- ERP can improve quality and efficiency of the business. By keeping a company's internal business processes running smoothly, ERP can lead to better outputs that may benefit the company, such as in customer service and manufacturing.
- ERP supports upper level management by providing information for decision making.
- ERP creates a more agile company that adapts better to change. ERP makes a company more flexible and less rigidly structured so organization components operate more cohesively, enhancing the business—internally and externally.
- ERP can improve data security. A common control system, such as the kind offered by ERP systems, allows organizations the ability to more easily ensure key company data is not compromised.
- ERP provides increased opportunities for collaboration. Data takes many forms in the modern enterprise. Documents, files, forms, audio and video, emails. Often, each data medium has its own mechanism for allowing collaboration. ERP provides a collaborative platform that lets employees spend more time collaborating on content rather than mastering the learning curve of communicating in various formats across distributed systems.

Disadvantages of ERP:

- Customization can be problematic. Compared to the best-of-breed approach, ERP can be seen as meeting an organization’s lowest common denominator needs, forcing the organization to find workarounds to meet unique demands.

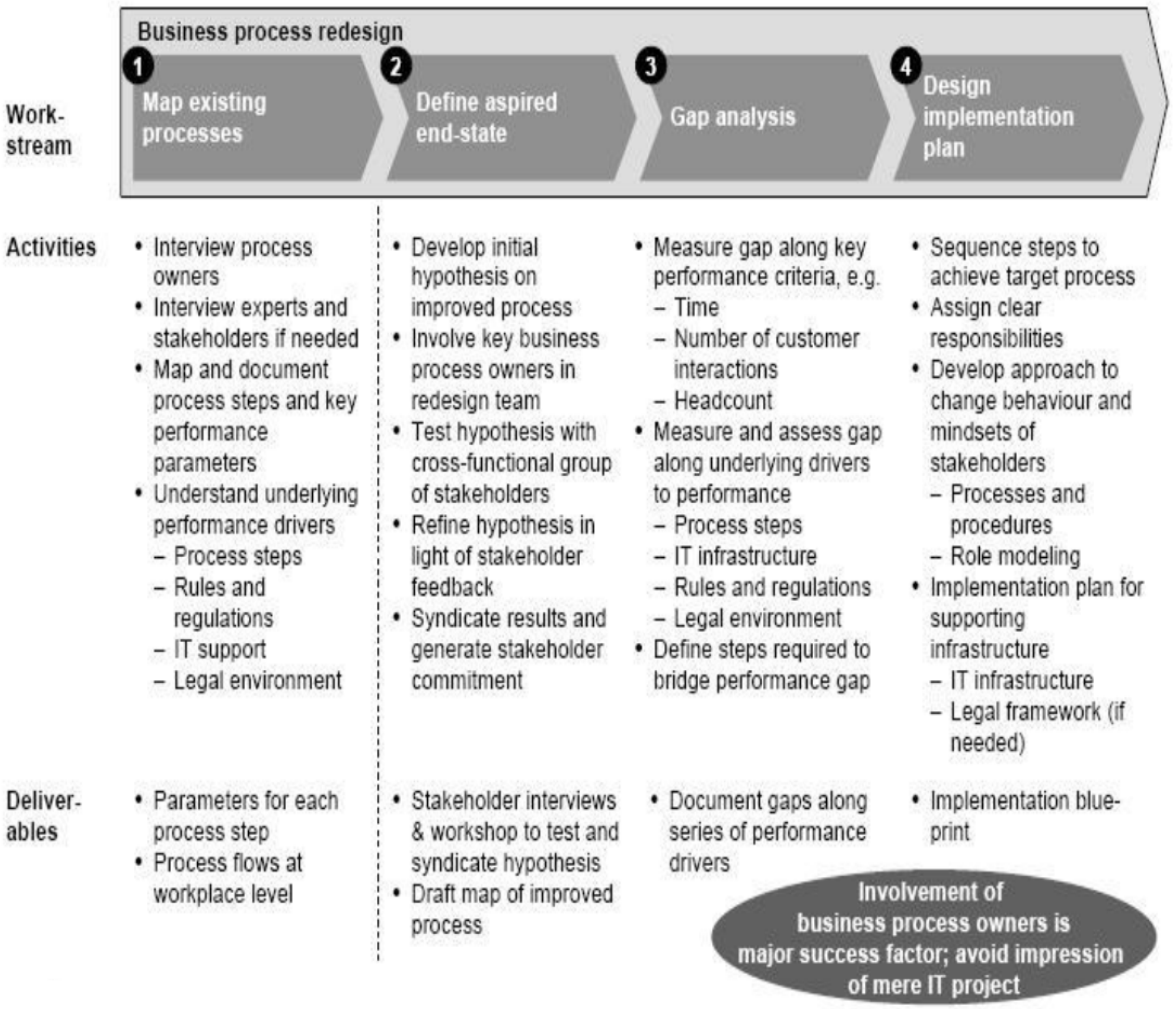
- Re-engineering business processes to fit the ERP system may damage competitiveness or divert focus from other critical activities.
- ERP can cost more than less integrated or less comprehensive solutions.
- High ERP switching costs can increase the ERP vendor's negotiating power, which can increase support, maintenance, and upgrade expenses.
- Overcoming resistance to sharing sensitive information between departments can divert management attention.
- Integration of truly independent businesses can create unnecessary dependencies.
- Extensive training requirements take resources from daily operations.
- Due to ERP's architecture (OLTP, On-Line Transaction Processing) ERP systems are not well suited for production planning and supply chain management (SCM).
- Harmonization of ERP systems can be a mammoth task (especially for big companies) and requires a lot of time, planning, and money.

Business Process Redesign:

- It is a business management strategy focusing on the analysis and design of workflows and business processes within an organization.
- BPR aimed to help organizations fundamentally rethink how they do their work in order to dramatically improve customer service, cut operational costs, and become world-class competitors.
- Business Process Reengineering (BPR) is the practice of rethinking and redesigning the way work is done to better support an organization's mission and reduce costs. Reengineering starts with a high-level assessment of the organization's mission, strategic goals, and customer needs.
- Within the framework of this basic assessment of mission and goals, re-engineering focuses on the organization's business processes—the steps and procedures that govern how resources are used to create products and services that meet the needs of particular customers or markets. As a structured ordering of work steps across time and place, a business process can be decomposed into specific activities, measured, modeled, and improved. It can also be completely redesigned or eliminated altogether. Re-engineering identifies, analyzes, and re-designs an organization's core business processes with the aim of achieving dramatic improvements in critical performance measures, such as cost, quality, service, and speed.
- Re-engineering recognizes that an organization's business processes are usually fragmented into subprocesses and tasks that are carried out by several specialized

functional areas within the organization. Often, no one is responsible for the overall performance of the entire process. Re-engineering maintains that optimizing the performance of sub processes can result in some benefits, but cannot yield dramatic improvements if the process itself is fundamentally inefficient and outmoded. For that reason, re-engineering focuses on re-designing the process as a whole in order to achieve the greatest possible benefits to the organization and their customers. This drive for realizing dramatic improvements by fundamentally re-thinking how the organization's work should be done distinguishes re-engineering from process improvement efforts that focus on functional or incremental improvement.

BUSINESS PROCESS REDESIGN METHODOLOGY IN FOUR STAGES



Knowledge Engineering:

Knowledge Engineering (KE) refers to all technical, scientific and social aspects involved in building, maintaining and using knowledge-based systems.

There were essentially two approaches that were attempted:

1. Use conventional software development methodologies
2. Develop special methodologies tuned to the requirements of building expert systems

Many of the early expert systems were developed by large consulting and system integration firms such as Andersen Consulting. These firms already had well tested conventional waterfall methodologies (e.g. Method/1 for Andersen) that they trained all their staff in and that were virtually always used to develop software for their clients. One trend in early expert systems development was to simply apply these waterfall methods to expert systems development.

Another issue with using conventional methods to develop expert systems was that due to the unprecedented nature of expert systems they were one of the first applications to adopt rapid application development methods that feature iteration and prototyping as well as or instead of detailed analysis and design. In the 1980s few conventional software methods supported this type of approach.

The final issue with using conventional methods to develop expert systems was the need for knowledge acquisition. Knowledge acquisition refers to the process of gathering expert knowledge and capturing it in the form of rules and ontologies. Knowledge acquisition has special requirements beyond the conventional specification process used to capture most business requirements.

These issues led to the second approach to knowledge engineering: development of custom methodologies specifically designed to build expert systems. One of the first and most popular of such methodologies custom designed for expert systems was the Knowledge Acquisition and Documentation Structuring (KADS) methodology developed in Europe.

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