Enterprise Resource Planning -ERP

What is ERP?

Definition:

- ENTERPRISE RESOURCE PLANNING(ERP) is a cross-functional enterprise system driven by an integrated suite of software modules that supports the basic internal business processes of a company

What is ERP?

- The practice of consolidating an enterprise's planning, manufacturing, sales and marketing efforts into one management system.
- Combines all databases across departments into a single database that can be accessed by all employees.
- ERP automates the tasks involved in performing a business process.

Before ERP example

Order parts

Ship parts.

Sales dept.
Demographic Files

Sends report

Check for parts

We ordered parts

Call back "not in stock"

Ship parts.

Accounting dept.
Accounting Files

Ship parts.

Warehouse
Inventory Files

"we ordered parts"

"we need parts"

Place order

Sends report

Purchasing dept.
Purchasing Files

Typical Business Process : Key observation

- A typical enterprise has **many Departments/ Business units(BU).**
- These Departments/ BU continuously **communicate and exchange data** with each other.
- The **success of any organization lie's in effective communication and data exchange within the Departments/ BU** as well as associated third party such as Vendors, Outsourcers and Costumers.
- Also known as **Decentralized System**.

Problems with Decentralized System

- Numerous disparate information system are developed individually over the time.
- Integrating the data becomes time and money consuming.
- Inconsistences and duplication of data.
- High inventory, material and human resource cost.

Centralized System : ERP example

CUSTOMERS

Order parts

Sales Dept.

Inventory data

Accounting

Financial data exchenge

Database

Purchasing data

Books Inventory

Vendor

Order is placed

Purchasing Dept.

Warehouse

Ship parts

Invoice Accounting

Centralized System : Key observation

- Data is maintained at a **central location** and is shared with various Departments.
- Departments **have access information/ data of the other Departments/ BU/**

Benefits of Centralized System

- Eliminates the duplication, discontinuity and redundancy in data.
- Provides information across departments in real time.
- Provides control over various business processes.
- Increase Productivity, better inventory management, promotes quality, reduced material cost, boosts profits.
- Better Customers interaction, increased throughput, improves customer services.

ERP Application Components

Source : https://www.linkedin.com/pulse/20140926221018-366028342-10-emerging-trends-in-erp

ERP Components

- **Financial Management**
  At the core of ERP are the financial modules, including general ledger, accounts receivable, accounts payable, billing and fixed asset management. If your organization is considering the move to an ERP system to support expansion into global markets, make sure that multiple currencies and languages are supported, as well as regulatory compliance in the U.S. and in foreign countries.

Other functionality in the financial management modules will include budgets, cash-flow, expense and tax reporting. The evaluation team should focus on areas that are most important to support the strategic plans for your organization.

ERP Components

- **Business Intelligence**
  Business Intelligence (BI) has become a standard component of most ERP packages. In general, BI tools allow users to share and analyse the data collected across the enterprise and centralized in the ERP database. BI can come in the form of dashboards, automated reporting and analysis tools used to monitor the organizational business performance. BI supports informed decision making by everyone, from executives to line managers and accountants.

ERP Components

- **Supply Chain Management**
  Supply Chain Management (SCM), sometimes referred to as logistics, improves the flow of materials through an organization by managing planning, scheduling, procurement, and fulfillment, to maximize customer satisfaction and profitability. Sub modules in SCM often include production scheduling, demand management, distribution management, inventory management, warehouse management, procurement and order management..

ERP Components

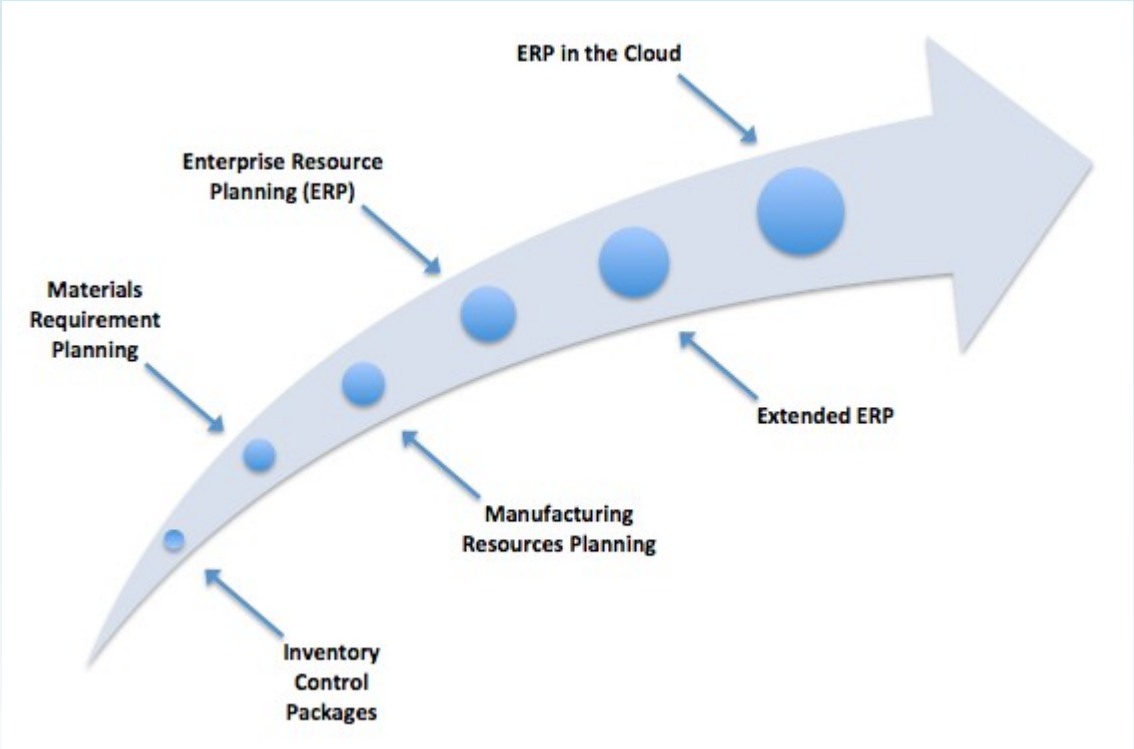
- **Human Resource Management**
  Human resource management ERP modules should enhance the employee experience – from initial recruitment to time tracking. Â Sub modules can include payroll, performance management, time tracking, benefits, compensation and workforce planning. Self-service tools that allow managers and employees to enter time and attendance, choose benefits and manage PTO are available in many ERP solutions.

ERP Components

- **Manufacturing Operations**
  Manufacturing modules make manufacturing operations more efficient through product configuration, job costing and bill of materials management. ERP manufacturing modules often include Capacity Requirements Planning, Materials Requirements Planning, forecasting, Master Production Scheduling, work-order management and shop-floor control
- **Integration**
  Key to the value of an ERP package is the integration between modules, so that all of the core business functions are connected. Information should flow across the organization so that BI reports on organization-wide results.

ERP Evolution

From manufacturing co-ordination to enterprise wide backend solutions.



ERP Evolution

- **Inventory Management & Control-1960's**

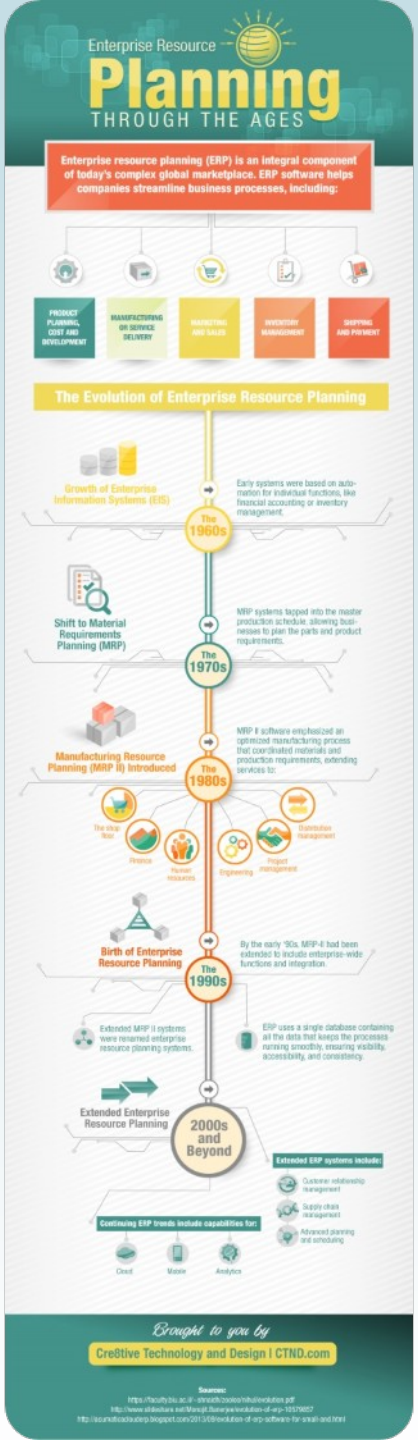
  Inventory Management and control is the combination of information technology and business processes of maintaining the appropriate level of stock in a warehouse. The activities of inventory management include identifying inventory requirements, setting targets, providing replenishment techniques and options, monitoring item usages, reconciling the inventory balances, and reporting inventory status.

ERP Evolution

- **Material Requirement Planning (MRP)-1970's**
  Materials Requirement Planning (MRP) utilizes software applications for scheduling production processes. MRP generates schedules for the operations and raw material purchases based on the production requirements of finished goods, the structure of the production system, the current inventories levels and the lot sizing procedure for each operation
- **Manufacturing Requirements Planning (MRP II)-1980's** *Manufacturing Requirements Planning or MRP utilizes software applications for coordinating manufacturing processes, from product planning, parts purchasing, inventory control to product distribution.*

ERP Evolution

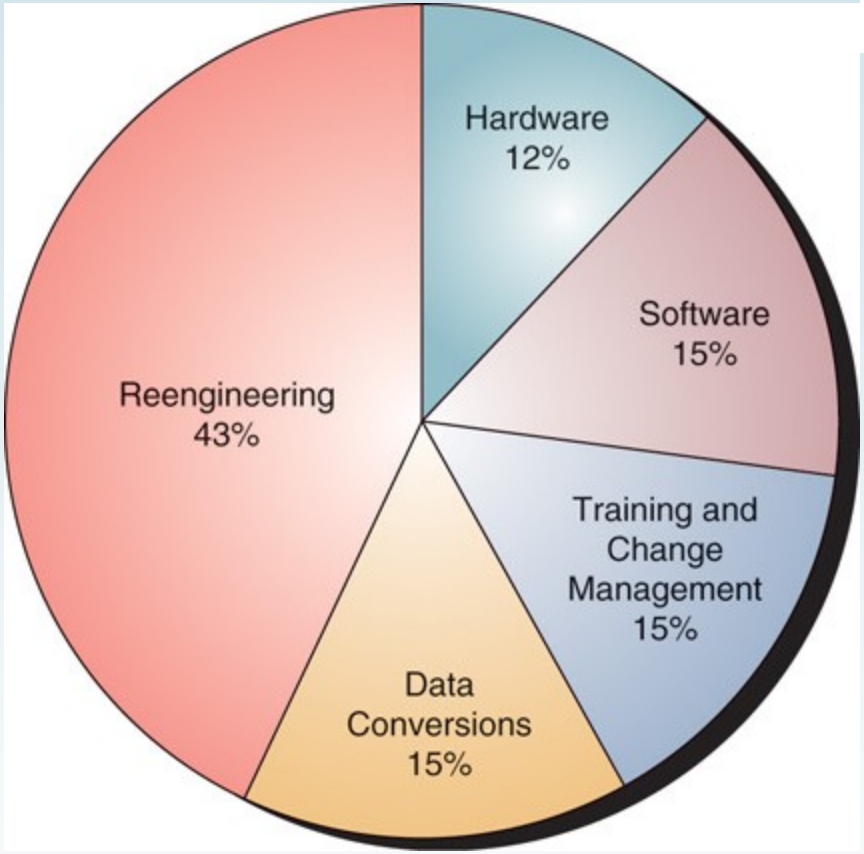
- **Enterprise Resource Planning (ERP)-1990's**
  Enterprise Resource Planning or ERP uses multi-module application software for improving the performance of the internal business processes. ERP systems often integrates business activities across functional departments, from product planning, parts purchasing, inventory control, product distribution, fulfillment, to order tracking. ERP software systems may include application modules for supporting marketing, finance, accounting and human resources.


Enterprise Resource
Planning
THROUGH THE AGES
Enterprise resource planning (ERP) is an integral component of today's complex global marketplace. ERP software helps companies streamline business processes, including:
PRODUCT PLANNING, COST AND DEVELOPMENT
MANUFACTURING OR SERVICE DELIVERY
MARKETING AND SALES
INVENTORY MANAGEMENT
SHIPPING AND PAYMENT
The Evolution of Enterprise Resource Planning
Growth of Enterprise Information Systems (EIS)
Early systems were based on automation for individual functions, like financial accounting or inventory management.
The 1960s
Shift to Material Requirements Planning (MRP)
MRP systems tapped into the master production schedule, allowing businesses to plan the parts and product requirements.
The 1970s
Manufacturing Resource Planning (MRP II) Introduced
MRP II software emphasized an optimized manufacturing process that coordinated materials and production requirements, extending services to:
The shop floor
Finance
Human resources
Engineering
Project management
Distribution management
The 1980s
Birth of Enterprise Resource Planning
By the early '90s, MRP-II had been extended to include enterprise-wide functions and integration.
The 1990s
Extended MRP II systems were renamed enterprise resource planning systems.
ERP uses a single database containing all the data that keeps the processes running smoothly, ensuring visibility, accessibility, and consistency.
Extended Enterprise Resource Planning
2000s and Beyond
Extended ERP systems include:
Customer relationship management
Supply chain management
Advanced planning and scheduling
Continuing ERP trends include capabilities for:
Cloud
Mobile
Analytics
Brought to you by
Creative Technology and Design | CTND.com
Sources:

ERP
ENTERPRISE RESOURCE PLANNING
manufacturing
customer
management
enterprise
organization

Costs of ERP

manufacturing
customer
ERP
management
enterprise
organization


Hardware
12%
Software
15%
Training and
Change
Management
15%
Data
Conversions
15%
Reengineering
43%

High Level Summary Costs of 3 Different On-Premise Scenarios

- *(1) 3 CONCURRENT USERS – FINANCIAL MODULES ONLY*
  This scenario is about $20,000-$30,000 (software & implementation services. Hardware is extra).

- *(2) 7-10 CONCURRENT USERS – FINANCIALS, SALES & INVENTORY FUNCTIONALITY*
  This scenario is about $60,000-$90,000 (software & implementation services. Hardware is extra).

- *(3) 12-15 CONCURRENT USERS – FINANCIALS, SALES, INVENTORY FUNCTIONALITY*
  This scenario is about $120,000-$180,000 (software & implementation services. Hardware is extra).

ERP Project and Time

- Real transformational ERP efforts will usually run between 1 to 3 years, on average.
- Short implementations (3 to 6 months):
  - small companies,
  - implementation limited to a small area of the company, or
  - the company only used the financial pieces of the ERP system.
- The important thing is not to focus on how long it will take but to understand why you need ERP and how you will use it to improve your business.

Hidden Costs of ERP

- Training
- Integration and testing
- Data conversion
- Data analysis
- Consultants
- Replacing best and brightest staff after implementation
- Implementation teams can never stop
- Waiting for ROI
- Post-ERP depression

Benefits of ERP Systems

- Improving integration, flexibility
- Fewer errors
- Improved speed and efficiency
- More complete access to information
- Lower total costs in the complete supply chain
- Shorten throughput times
- Sustained involvement and commitment of the top management

Benefits of ERP Systems

- Reduce stock to a minimum
- Enlarge product assortment
- Improve product quality
- Provide more reliable delivery dates and higher service to the customer
- Efficiently coordinate global demand, supply and production

ERP Implementation

- Biggest IT project that most companies ever handle,
- Changes the entire company, and
- Has repercussions in all departments and divisions of the organization.
- It is essential that all the key players understand the scope of the project.
- This is an **IT-Related** Project.

ERP Implementation Phases

4 Major Phases:

- Concept/initiation
- Development
- Implementation
- Closeout/Operation and maintenance

Risks with ERP Implementation

- Expensive (can costs 100 thousands to millions of dollars)
- Time-consuming (can take months to years)
- Great risk for the organization
- Transfer of Knowledge
- Acceptance with the company

Causes of ERP Failures

- Business mangers and IT professionals underestimate the complexity of the planning, development, and training needed
- Failure to involve affected employees in the planning and development phases
- Trying to do too much too fast in the conversion process
- Failure to do enough data conversion and testing

Conclusion

- The benefits of a properly selected and implemented ERP system can be significant.
  - An average, 25 to 30% reduction on inventory costs; 25% reduction on raw material costs.
  - Lead-time for customers, production time, and production costs can be reduced.
- BUT cost of implementing can be quite high and risks are great.

Best Practices of ERP Implementation

- *Change Management*
- *Extensive Education and Training*
- *Data Clean up and Data Integrity*
- *Implementation is viewed as an ongoing process*

Best Practices of ERP Implementation

- *Change Management*
  - *Changes in business procedures, responsibilities, work load.*[1]
  - *As a result, ERP implementations are times of high stress, long hours, and uncertainty.*[1]
  - *Mid-level managers must*[2]
    - *facilitate continual feedback from employees,*
    - *provide honest answers to their questions, and*
    - *help resolve their problems.*

Sources:
1. Yakovlev, I.V., "An ERP Implementation and Business Process Reengineering at a Small University", Educause Quarterly, Number 2, 2002;
2. Umble, M. Michael, "Avoiding ERP Implementation Failure", Industrial Management, Jan/Feb 2002.

Best Practices of ERP Implementation

- *Extensive Education and Training*
  - *General education about the ERP system for everyone.*
  - *Massive amount of end users training before and during implementation.*
  - *Follow-up training after the implementation.*
  - *10 to 15% of total ERP implementation budget for training will give an organization an 80% chance of a successful implementation.*

Source: Umble, M. Michael, “Avoiding ERP Implementation Failure”, Industrial Management, Jan/Feb 2002.

Best Practices of ERP Implementation

- *Data Clean up and Data Integrity*
  - *Clean-up data before cut-over.*[1]
  - *"Near enough is no longer good enough."*[2]
  - *To command trust, the data in the system must be sufficiently available and accurate.*[3]
  - *Eliminate the old systems, including all informal systems.*[3]

Sources:
1. http://www.bpic.co.uk/checklst.htm, viewed November 5, 2002;
2. http://www.projectperfect.com.au/info_erp_imp.htm, viewed November 5, 2002;
3. M. Michael Umble, "Avoiding ERP Implementation Failure", *Industrial Management*, Jan/Feb 2002.

Best Practices of ERP Implementation

- *Implementation is viewed as an ongoing process*
  - *Ongoing need for training and software support after implementation.*
  - *Ongoing need to keep in contact with all system users and monitor the use of the new system.*
  - *Ongoing process of learning and adaptation that continually evolves over time.*

Source: Umble, M. Michael, “Avoiding ERP Implementation Failure”, Industrial Management, Jan/Feb 2002.

Main ERP vendors

invensys

BaaN

JDEDWARDS

ORACLE

PeopleSoft

SAP

Thank You!