

Enterprise Systems & Architecture

ERP

ERP: Enterprise Resource Planning

The Business Backbone

- ERP is a cross-functional enterprise backbone that integrates and automates processes within
 - Manufacturing
 - Logistics / Distribution
 - Finance / Accounting
 - Human resources

ERP-definitions

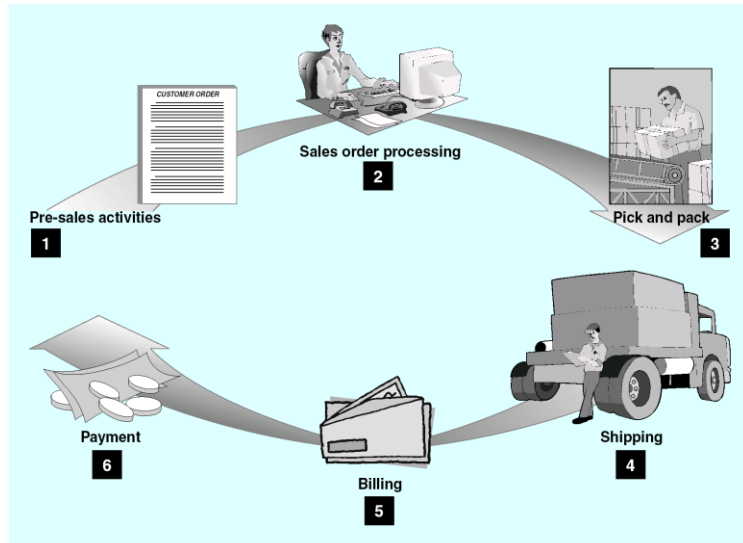
- Enterprise resource planning (ERP) is:
 - A process of **managing all resources** and their use in the entire enterprise **in a coordinated manner** - ERP software ties all departments in a company together into one common system
 - ERP is a set of **integrated business applications**, or modules which **carry out common business functions** such as general ledger, sales forecasting....
 - Support business through optimizing, maintaining, and tracking business functions: HR, financial, manufacturing etc...
 - *Therefore providing consistent information for timely decision-making and performance measurement*

ERP Intro... (SAP promo)

<http://www.youtube.com/watch?v=IYCEQqSM08I>

Example of a business process:

Purchase Order process ...



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Example methods to perform a sales order business process.

- Sales order business process steps:

- take the ordered items
- provide pricing information
- estimate delivery date
- check availability of credit for the caller

- Potential solutions:

- Manual/semi-automated approach
- E.A.I.
- E.R.P.

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Manual/semi-automated

- In a manual system it would require information exchange via telephone.
- Then some of the above steps could be done via an information system; e.g. record purchase order... however such a non integrated system would require the use of multiple computer systems

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EAI – Some problems with integration of function based systems

- Data Sharing (data transformation) between systems
 - Data duplication and inconsistencies
 - Which is the true address or order?
 - Data model inconsistencies
- Partial information leads to isolated decisions lead to overall inefficiencies
 - Increased expenses

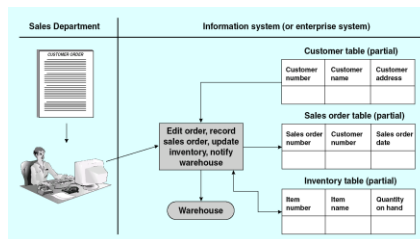
Enterprise Resource Planning system

- ERP is:
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Requirements to automate the purchase order process

- Provide sales department with a single point of access from which they can complete the business order process
 - Obtain /record information (availability of items, record sales order)
 - Request initiation of internal processes (time to manufacture and deliver items)
 - Provide reliable information to the customer (delivery date, price)



The screenshot shows the SAP 'Create Standard Order: Overview' screen. Four red circles with numbers 1, 2, 3, and 4 highlight specific fields:

- 1** highlights the 'Ship-To Party' field, which contains '1010'.
- 2** highlights the 'Req. deliv. date' field, which contains '21.11.2012'.
- 3** highlights the 'Order Quantity' field in the 'All items' table, which contains '20'.
- 4** highlights the 'Extras' menu icon in the top toolbar.

The 'All items' table is as follows:

| Item | Material | Order Quantity | Un | Description | S | Customer Material Numb |
|------|----------|----------------|----|----------------|-------------------------------------|------------------------|
| | 10 H-01 | 20 | PC | Sunny Sunny 01 | <input checked="" type="checkbox"/> | |
| | | | | | <input type="checkbox"/> | |
| | | | | | <input type="checkbox"/> | |
| | | | | | <input type="checkbox"/> | |

Enterprise Resource Planning

- ERP is
 - Focused on **value chains**, rather than individual functions
 - More about **business process change** than technology
- ERP core capabilities include
 - Integrated modules
 - Common process and data models and definitions
 - Common database
 - Update one module, automatically updates others

Benefits of ERP

- Common set of data
 - Removes consistency and synchronisation issues
- Library of available *standard* template processes and modules make integration easier
- Inter-department integration for all departments using the ERP
 - Allow companies to better understand their business.
 - Helps companies standardize business processes and more easily enact best practices.
 - More efficient processes enable companies to concentrate their efforts on serving their customers, maximizing profit, and building a competitive advantage.

Potential Limitations of ERP

- Global ERP can be a never-ending project for large organisations
- No organisation exists in isolation: Value chain business processes
 - There are always suppliers and clients who use different data models.
 - This means that the *need for integration cannot be removed*.
- Inter-department integration relies on using the global ERP
 - Causes problems with anomalous departments, recently required, geographically isolated or with different business processes.
- The software can drive the business rather than the other way around
 - Templates tend to impose the *standard* business process rather than your organisations business process. This is okay for commoditised processes but not for all.

The “modular” ERP System

- Most systems are modular to permit automating some functions but not others.
- Some common modules, such as finance and accounting, are adopted by nearly all users; others such as human resource management are not.
- For example, a service company probably has no need for a manufacturing module.
- Other companies already have a system that they believe to be adequate. Generally speaking, the greater the number of modules selected, the greater the integration benefits, but also the greater the costs, risks and changes involved.

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Elements of the ERP example

- **Decision making modules:** Technology to integrate people, information and business processes across technologies; e.g. information integration in a data warehouse
- **Operations:** All value chain processes: purchasing, production, sales.

Finance modules

- All kind of organizations small scale, large scale organizations benefit from the implementation of ERP financial module.
- The financial module is the core of many ERP software systems.
- It can gather financial data from various functional departments, and generates valuable financial reports such:
 - general ledger / balance sheet
 - quarterly financial statements

Human Resource module

- Human Resources is another widely implemented ERP module.
- HR module streamlines the management of human resources and human capitals. HR modules routinely maintain a complete employee database including:
 - contact information,
 - salary details,
 - attendance,
 - performance evaluation
 - and promotion of all employees.

ERP Purchasing module

- Purchase module streamline procurement of required raw materials.
- It automates the processes of:
 - identifying potential suppliers,
 - negotiating price,
 - awarding purchase order to the supplier,
 - billing processes.
- Purchase module is tightly integrated with
 - *the inventory control and production planning modules*
- The purchasing module is often integrated with supply chain management software (see next lecture).

ERP Sales and Marketing module

- Sales module implements functions:
 - order placement,
 - order scheduling,
 - shipping and invoicing (in conjunction with other modules).
- *Sales module* is closely integrated with organizations' *ecommerce websites*.
- Many ERP vendors offer online store front as part of the sales module.
- ERP *marketing module* along with *Customer relations management (CRM)* software (see next lecture) supports:
 - lead generation,
 - direct mailing campaign and other marketing works.
 - Scheduling of the promotions

Different ERP Implementation Approaches / Options

- **Complete system.**
 - Create IT architecture from scratch
 - Uncommon as there are few new companies which start off large enough to implement ERP
- **ERP by Process**
 - Deploy one or a few ERP modules across all Business Units
 - Risk: May never extend beyond original process.
- **ERP by Business Unit**
 - Deploy fully integrated ERP suite in one or more Business Units
 - Risk: May never extend beyond original function.
- **Fully Integrated (with current Enterprise architecture) ERP**
 - Full scale deployment across the enterprise
 - Risk: Very expensive and could take a long time before getting a return
- **Post Modern ERP**
 - Mixture of cloud and on-premise ERP solution
 - What goes on-premise and what goes in the cloud?

Some of the risk implementation Factors

- No clear goal
- Lack of clear planning
- Under-estimating resources required
- Customisations
- Insufficient testing

No clear goal

- Often, lack of consensus on the problems being solved, the outcome desired, or the specific financial justification of the project, leads to challenges later controlling the scope and maintaining executive sponsorship.
- Having a clear destination means defining the important business processes, financial benefits,

Lack of detailed planning

- All projects of this size start with some kind of plan. However, more times than not, the plan is not realistic, detailed, or specific enough.
- To be a good plan, it needs to identify all the requirements and the people who are going to work on them.
- It needs to be at a level of detail where a knowledgeable person can visualize the work, usually in work blocks of a few days.

Under-estimating resources required

- Having a solid understanding of the internal and external resources needed to complete the project is critical. E.g.:
 - For internal resources, understanding the time commitment needed from business users, typically in the Finance, Accounting, or Human Resources departments, is one of the most commonly underestimated areas.
 - For external resources, having an agreement up-front with your consultants and contractors about the specific duration, skills, and quantity of resources needed is critical.

Customisations

- ***Customisations, along with interfaces and data conversion, are the main areas of technical risk in ERP implementations.***
- Customizations always start out small, but incrementally grow to become the technical challenges that derail these projects.

Insufficient testing

- When schedules get tight, reducing the number and depth of test cycles is often one of the first areas that often gets cut.
- The purpose of testing in an ERP project is not to see if the software works. **The purpose is to see if the system meets your business needs and produces the output you need.**
- Reducing testing may not leave defects undiscovered, but it certainly **increases the risk the ERP system will be missing important functions or not be well accepted by end users.**

Reasonable clip on ERP and SAP Business One

<http://www.youtube.com/watch?v=Dlogvnjx71A>