

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

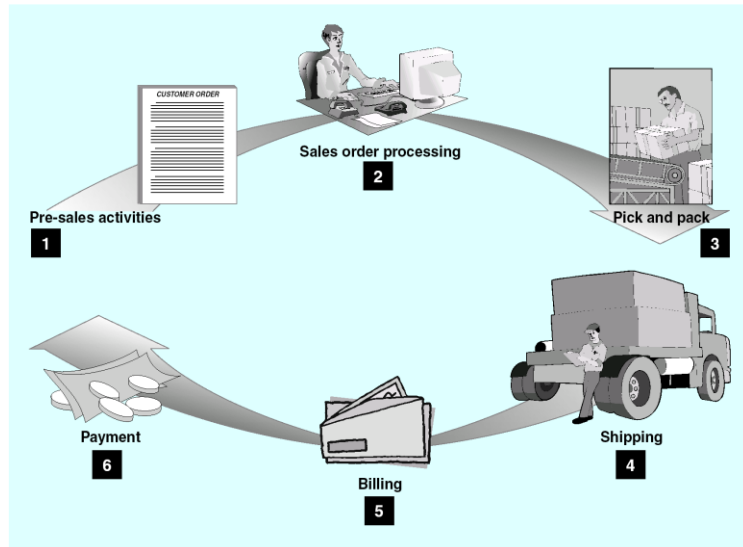
- Enterprise resource planning (ERP) is:
 - A process of **managing all resources** and their use in the entire enterprise **in a coordinated manner** - ERP software ties all departments in a company together into one common system
 - ERP is a set of **integrated business applications**, or modules which **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 customer

- 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

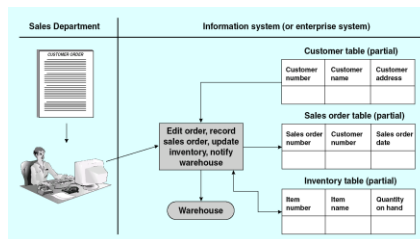
Enterprise Resource Planning system

- ERP is:
 - A process of managing all resources and their use in the entire enterprise in a coordinated manner
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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. The interface includes a menu bar (Sales document, Edit, Goto, Extras, Environment, System, Help) and a toolbar. The main form contains the following fields and sections:

- Standard Order:** A text field with a value of 1000.
- Net value:** A text field with a value of 20.000,00 EUR.
- Sold-To Party:** A text field with a value of 1000.
- Ship-To Party:** A text field with a value of 1010.
- PO Number:** A text field with a value of 2.
- PO date:** A text field with a value of 10.11.2012.
- Becker Berlin / Calvinstrasse 36 / 13467 Berlin-Hermsdorf** (Address line 1).
- Becker Berlin (Versand) / Beatestrasse 4 / 13505 Berlin-Konrad** (Address line 2).
- Req. deliv.date:** A text field with a value of 21.11.2012.
- Deliver.Plant:** A text field.
- Total Weight:** A text field with a value of 336 KG.
- Volume:** A text field with a value of 3 M3.
- Pricing date:** A text field with a value of 10.11.2012.
- Exp.date:** A text field.
- Payment terms:** A text field with a value of ZB01 14 Days 3%, 30/2...
- Incoterms:** A text field with a value of CIF Berlin.
- Order reason:** A dropdown menu.
- All items table:**

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

Annotations on the screenshot:

- 1:** Points to the Ship-To Party field (1010).
- 2:** Points to the Req. deliv.date field (21.11.2012).
- 3:** Points to the Order Quantity field (20) in the All items table.
- 4:** Points to the Extras menu item.

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

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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.

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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 may 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>