IST 301: Process Integration
III-A Enterprise Resource Planning (SAP R/3)

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Learning Objectives
- Identify the factors that led to the development of ERP systems.
- To describe modules distinguishing characteristics of ERP software.
- To discuss the pros and cons of implementing ERP systems.

Before Enterprise Resource Planning
- Production Management
- Human Resources
- Manufacturing
- Accounting
- Marketing
- Finance
- Suppliers

Enterprise Resource Planning
- An ERP system, when implemented correctly, links all the functions of a business.

ERP Definition
- An ERP system is a packaged business software system that allows a company to automate and integrate the majority of its business process; share common data and practices across the enterprise; and produce and access information in real-time environment.

Evolution of ERP Systems
- 1970s
  - MRP
  - Material Requirement Planning
- 1980s
  - MRP-II
  - Manufacturing Resource Planning
  - ERP Systems
Major Vendors for ERP Systems

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Special Software Feature</th>
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<tbody>
<tr>
<td>America Software</td>
<td>Comprehensive, focus on supply chain management</td>
</tr>
<tr>
<td>The Baan Company</td>
<td>Comprehensive, selection of software for flow and discrete manufacturing</td>
</tr>
<tr>
<td>I2 Technologies</td>
<td>Forecasting, and flow manufacturing</td>
</tr>
<tr>
<td>Manugistics</td>
<td>Optimization for logistics</td>
</tr>
<tr>
<td>Oracle</td>
<td>Comprehensive system, database</td>
</tr>
<tr>
<td>PeopleSoft</td>
<td>Comprehensive client/server</td>
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<tr>
<td>SAP</td>
<td>Integrated client/server</td>
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</tbody>
</table>

R/3 Hardware-Three Tier Architecture

- Database Servers
- Applications Servers
- Presentation User (Computers)

SAP R/3 Concept

- Information Technology
- Manufacturing
- Accounting
- Marketing
- Finance
Legacy Systems

The Free On-Line Dictionary Of Computing (FOLDOC) defines them as, "A computer system or application program which continues to be used because of the prohibitive cost of replacing or redesigning it and despite its poor competitiveness and compatibility with modern equivalents. The implication is that the system is large, monolithic and difficult to modify."

Case Study

Video Case Study: ERP Systems implementation at Hillerich & Bradsby

SAP R/3 Penn State

http://s04.win.psu.edu/scripts/wgate/webgui/

An Example

The company receives a telephone inquiry from a potential customer. She wants 4000 pairs of shoes as soon as possible. The customer's details are taken and entered into SAP R/3 (Distribution, MD, as a Customer Master Record). This is the record of the company's business relationship with the customer and includes such items as the address, payment terms, sales history and company code.

The information entered in SD initiates the ordering process which starts with the production of a quotation for the customer. The quotation includes the information such as the prices, quantities, terms of the delivery and the period for which the quotation is valid.
A few days after submitting the quotation, a written order is received. The order can now be entered. Most of the data required for the order can be taken from the customer master record, so it does not have to be entered again. When the order entry is completed and the information is saved, the R/3 system automatically assigns an order number.

Now that the order has been confirmed and an order number assigned, the information is passed from SD to the Materials Management, MM, and Production Planning, PP, to initiate the production of the shoes.

The Materials Management module, MM, receives the information from SD that 4,000 pairs of shoes are scheduled to be delivered and checks the database for the number that are currently available. The inventory shows that there are only 1,000 pairs of shoes available. Additional 3,000 pairs of shoes will have to be manufactured to meet the customer's order.

MM reserves the existing shoes and all available parts which are in stock. It then orders additional unfinished parts from suppliers.

When the raw materials arrive from the suppliers, the warehouse clerk enters the details in MM to update the inventory.

MM provides the facility for invoice verification. This is used to check that each supplier invoice relates to the valid orders and that pricing. This information is then passed to the Finance and Accounting module, FI, which determines payments terms and arranges payment for the suppliers.
The Production Planning module, PP, schedules the machines necessary for the production of the shoes. It calculates the machine time required and the man hours that are needed to meet the order.

Logistics
Accounting
Human Resources

PP

Material Master

When planning the machine time to meet the production deadline, the PP module needs to postpone the maintenance of one of the machines. This information is passed to the Production Maintenance module, PM, for implementation.

Logistics
Accounting
Human Resources

PP
PM

QM

During the production, quality assurance is carried out through test schedules specified by the Quality Management (QM) module. When production and testing is complete, the final availability is fed back to MM and SD.

Logistics
Accounting
Human Resources

SD
MM
PP
PM
QM

R/3

Throughout the manufacturing process, any information which has financial implications has been passed to Financial Accounting from the Logistics modules. When FI is told that the order has been shipped, it creates the final invoice.

Logistics
Accounting
Human Resources

R/3

Customer Master

MM arranges for the completed order to be made up from the stocks in the warehouse. SD automatically prepares and arranges transport of the shoes to the customer.

Logistics
Accounting
Human Resources

R/3

PP

100 hours
When the customer pays the invoice, FI updates the general ledger account and the customer database.

The Controlling Module, CO, has been monitoring information from other modules. It uses this information to modify modules such as MM and PP to improve future performance. It also prepares performance reports.