Structure of the Lecture

Unit 1: Introduction
Unit 2: Central Processing Units
Unit 3: Storage and Data Structures
Unit 4: Input and Output Devices
Unit 5: Software
Unit 6: Networks, Data Interchange, and the Internet
Unit 7: Design, Development, Deployment, and Operations of Information Systems
Unit 8: Office Applications
Unit 9: Enterprise Applications
Unit 10: Supply Chain Applications and E-Business
Unit 11: Management Support Systems
Unit 12: Exam Review
Assignment from Last Week

- WI1, pp. 607-770; IBIS pp 161-167
- Review the slides

WI1 = Hansen/Neumann: Wirtschaftsinformatik 1; WI2 = Hansen/Neumann: Wirtschaftsinformatik 2; IBIS = Wigand et al: Introduction to Business Information Systems.

Link to the Previous Unit

- Last Unit:
  - Which are key transactions in industrial enterprises?
  - How can software support such business transactions?
- Today:
  - What is Enterprise Resource Planning (ERP) Software?
  - Why is it beneficial to integrate business processes not only inside a single enterprise, but also with respect to suppliers and customers?
  - What is Supply Chain Management and E-Business, and what are the technical approaches for the realization of these two visions?
Structure of the Unit

- Manufacturing Resource Planning (MRPII)
- Enterprise Resource Planning (ERP)
- Supply Chain Management (SCM)
- E-Business

MRPII – Manufacturing Resource Planning

- Includes requires workstation time, employees, and other resources.
- Capacity restrictions are included in the planning process.
Production Planning Problems

1. In which order should a stack of pending orders be produced?
2. Should pending orders be split into batches?
3. If there is choice in the sequencing of tasks, which is the ideal sequence?

Forward Scheduling

**Goal:** Determine earliest availability date if production run is started today

Harvest Corn → Grind Wheat → Mix Dough → Bake Bread

Today → Availability
Backward Scheduling

**Goal:** Determine latest production start for a given delivery date

![Diagram showing the production process: Harvest Corn, Grind Wheat, Mix Dough, Bake Bread.](image)

Structure of the Unit

- Overview
- Manufacturing Resource Planning (MRPII)
- Enterprise Resource Planning (ERP)
- Supply Chain Management (SCM)
- E-Business
Enterprise-wide Planning Scope

- Due to the complexity and degree of interdependencies, local planning scope is inefficient. Examples:
  - ordering the same part for each order individually
  - ordering a part that is already on stock in another department
  - blocking one scarce workstation with an unimportant order
- Enterprise-wide planning will result in better decision-making regarding inventory, procurement, production, and scheduling.

But:
- This requires a consistent representation of all data in the enterprise.

Process Integration

- Enterprise Management Level
- Planning and Control Systems
- Cross-sectional functions
  - Finance
  - Accounting
  - HR
  - Facilities Management
- Basic Functions
  - R&D
  - Sales
  - Procurement
  - Inventory Mgm
  - Production
  - Shipping
  - Customer
  - Service

Vertical Integration

Horizontal Integration

cf. Wigand et al. (2003), p. 80
The Idea of Enterprise Resource Planning (ERP)

- Planning of the usage of resources from the perspective of the overall enterprise.
- Capital, machinery, parts, human resources,…
- Usually on the basis of ERP software

ERP: One Integrated Planning System

- One database and data model across the enterprise
  - e.g. human resource data and staffing data for production planning come from the same database
- Consolidated and harmonized planning on all levels
- Best Practise Process Library
mySAP Business Suite

http://www.cio.com/research/erp/edit/erpbasics.html

Advantages of ERP

• Eliminates costly, inflexible legacy systems
• Improved technology infrastructure
• Improved work processes
• Increased data access for decision making
The Hidden Costs of ERP Deployment

• Training
• Integration and testing
• Customization
• Data conversion
• Data analysis
• Consultants ad infinitum
• Replacing your best and brightest
• Implementation teams can never stop
• Waiting for ROI
• Post-ERP depression

http://www.cio.com/research/erp/edit/erpbasics.html

Structure of the Unit

• Manufacturing Resource Planning (MRPII)
• Enterprise Resource Planning (ERP)
• Supply Chain Management (SCM)
• E-Business
The General Challenge of Supply Chains: 
**Aligning development, production, marketing, and sales**
Competition of Supply Chains: The competitiveness is determined by the overall performance of all partners in the chain.

The Bullwhip Effect
Multi-stage, forecasting-based reordering works fine with stable demand.

Forrester (1961): Industrial Dynamics

http://www.heppnetz.de/teaching/gwi/
The Bullwhip Effect

However, variations in demand create shortages and excess inventory along the value chain in multi-stage, forecasting-based reordering.

Forrester (1961): Industrial Dynamics

The Beer Game


Supply Chains Management: *Methods and IT Structures for aligning development, production, marketing, and sales*

Share sales and forecast data, plans on new products, etc.
Structure of the Unit

- Overview
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- Supply Chain Management (SCM)
- E-Business

What is E-Business?

*Any* form of business operations between *any* two parties using *digital* communication *over open networks*, especially the Internet.

cf. e.g. Thome/Schinzer/Hepp (2005)
Electronic Business

- Business-to-consumer (B2C)
- Business-to-business (B2B)
- Consumer-to-consumer (C2C)
- Government-to-citizen (G2C)
  - aka e-government

Cf. Thome/Schinzer/Hepp (2005)
Example

http://www.heppnetz.de/teaching/gwi/

Example (2)

http://www.heppnetz.de/teaching/gwi/
Example (3)

Example (4)

Paper Media Integration

Coupon not redeemable for cash, is nontransferable and cannot be used in combination with any other coupon or discount. Limit one coupon per household. Good for a single purchase of merchandise only up to $2,000. Not valid on previous sales, installation fees, the purchase of gift cards, or Maytag’s Neptune™, Gemini™ and Wide-By-Side™ refrigeration lines of major appliance. Also, not valid on Viking appliances in Nevada stores.
Why is E-Business so popular?

- Reach
- Common Infrastructure
  - As soon as one is connected to the Internet, one can use all online services
- Speed and Asynchronous communication
- High degree of automation
- Ease-of-use, richness (e.g. images)
From “Make” to “Buy”

  - Computer-based trade processes reduce the transaction costs and trigger a shift towards the usage of markets.
- Transaction cost: The cost of using the market mechanism (Coase 1937)

Reduced Transaction Costs – Increased Market Volume

**eBay:**
- Active Users: 34.1 million
- Gross Merchandise Sales (GMS): $5.6 billion in Q2-03

**Walmart Inc.:**
- $ 62.1 billion in Q2-03
Assignment for Next Week

• WI1, pp. 771-835; IBIS, pp. 197-222
• Review the slides

WI1 = Hansen/Neumann: Wirtschaftsinformatik 1;

http://www.heppnetz.de/teaching/gwi/

Thank you!

The slides and additional materials will be available at
http://www.heppnetz.de/teaching/gwi/
E-Business: Delivery of Tangible Goods

Bonus Track 😊

http://www.heppnetz.de/teaching/gwi/

Cf. Stair / Reynolds
Reach

Make Your Customers Part of Your Business
Thank you!

The slides and additional materials will be available at
http://www.heppnetz.de/teaching/gwi/