

Grundzüge der Wirtschaftsinformatik *Introduction to Business Information Systems*

Unit 10

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

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

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Assignment from Last Week

- W11, pp. 607-770; IBIS pp 161-167
- Thome/Schinzer/Hepp: *Electronic Commerce und Electronic Business. Mehrwert durch Integration und Automation*, 3rd edition, Vahlen, Munich 2005, Chapter 1.
- Review the slides

W11 = Hansen/Neumann: Wirtschaftsinformatik 1; W12 = Hansen/Neumann: Wirtschaftsinformatik 2; IBIS = Wigand et al: Introduction to Business Information Systems.

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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?

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Structure of the Unit

- [Manufacturing Resource Planning \(MRPII\)](#)
- Enterprise Resource Planning (ERP)
- Supply Chain Management (SCM)
- E-Business

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MRPII – Manufacturing Resource Planning

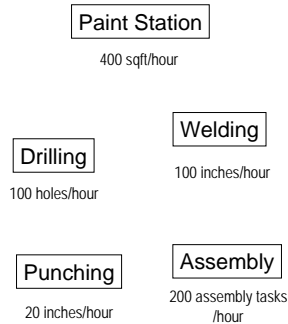
- Includes requires workstation time, employees, and other resources.
- Capacity restrictions are included in the planning process.

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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?

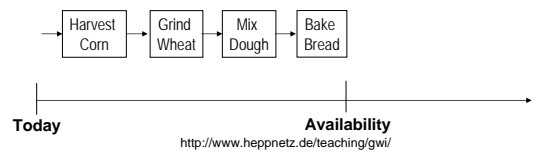


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Forward Scheduling

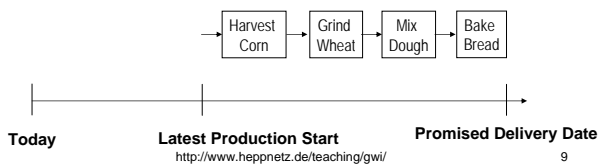
Goal: Determine earliest availability date if production run is started today



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Backward Scheduling

Goal: Determine latest production start for a given delivery date



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Structure of the Unit

- Overview
- Manufacturing Resource Planning (MRPII)
- Enterprise Resource Planning (ERP)
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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.

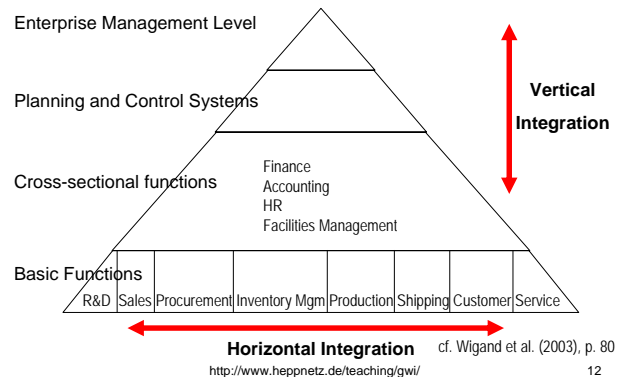
But:

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

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Process Integration



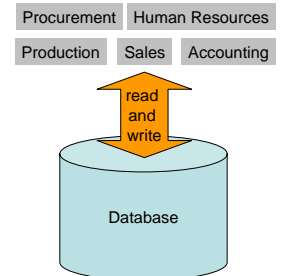
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The Idea of Enterprise Resource Planning (ERP)

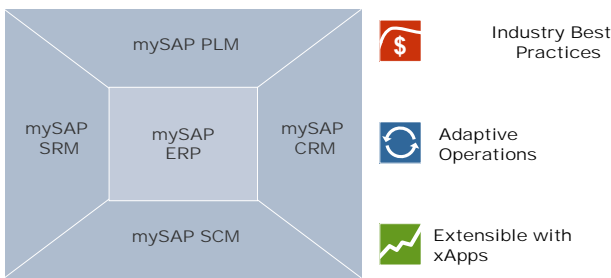
- Planning of the usage of resources *from the perspective of the overall enterprise.*
- Capital, machinery, parts, human resources,...
- Usually on the basis of ERP software

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

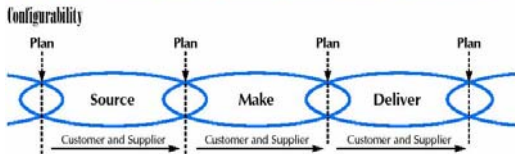
<http://www.cio.com/research/erp/edit/erpbasics.html>

Structure of the Unit

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Supply Chain

Each Basic Supply-Chain is a "Chain" of Source, Make, and Deliver Execution Processes

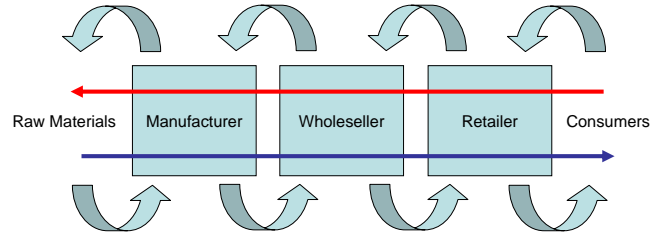


- Each intersection of two execution processes (Source-Make-Deliver) is a "link" in the supply chain
- Execution processes transform or transport materials and/or products
- Each process is a customer of the previous process and a supplier to the next
- Planning processes manage these customer-supplier links
- Planning processes thus "balance" the supply chain
- Every link *requires* an occurrence of a plan process category

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Cf. SCOR ¹⁹

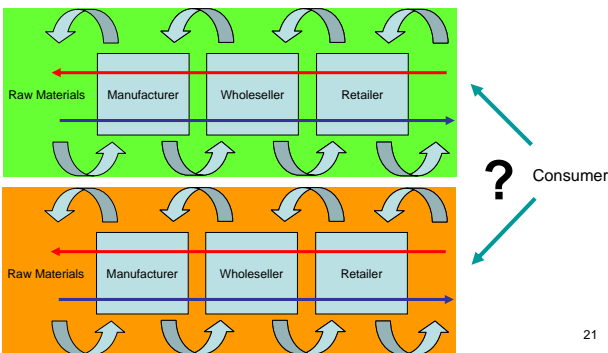
The General Challenge of Supply Chains: Aligning development, production, marketing, and sales



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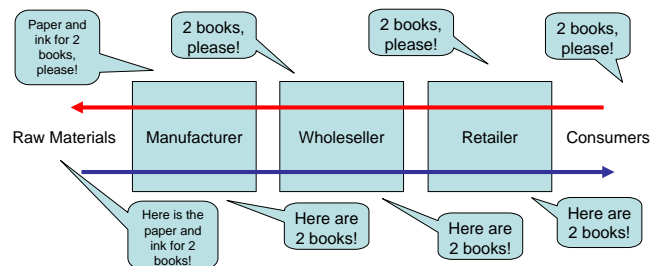
Competition of Supply Chains: The competitiveness is determined by the overall performance of all partners in the chain



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The Bullwhip Effect

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



Forrester(1961): *Industrial Dynamics*

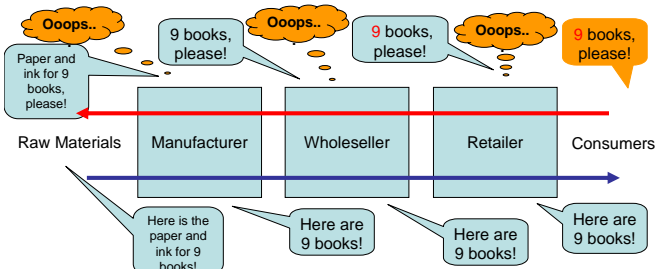
Lee/Padmanabhan/Whang (1997): *The Bullwhip Effect in Supply Chains*.

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The Bullwhip Effect

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



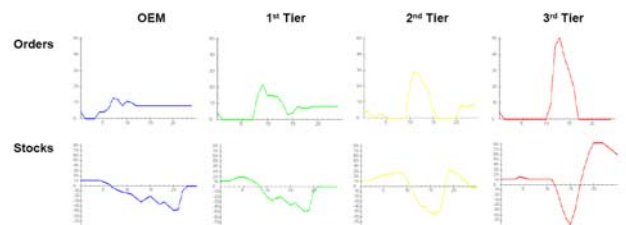
Forrester(1961): *Industrial Dynamics*

Lee/Padmanabhan/Whang (1997): *The Bullwhip Effect in Supply Chains*.

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The Bullwhip Effect



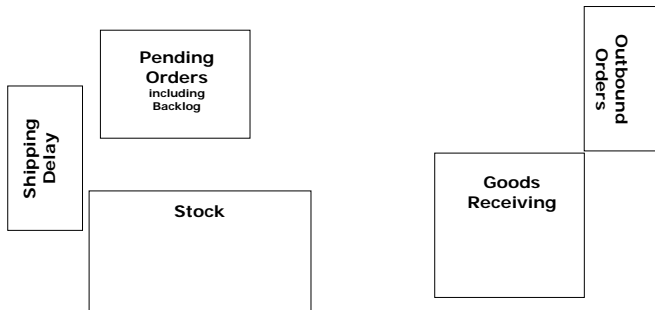
From: Nienhaus/Ziegenbein/Duijts (2002)

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

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The Beer Game

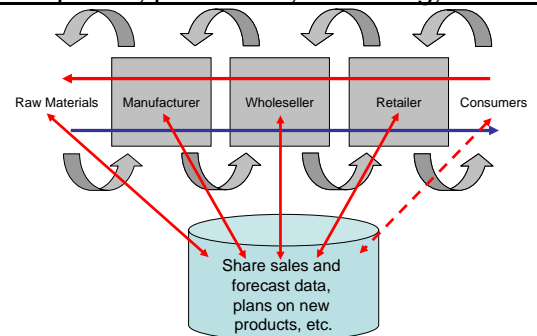
Online Beer Game: <http://www.beergame.lim.ethz.ch/>



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

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



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

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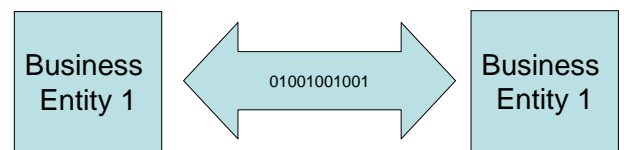
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What is E-Business?



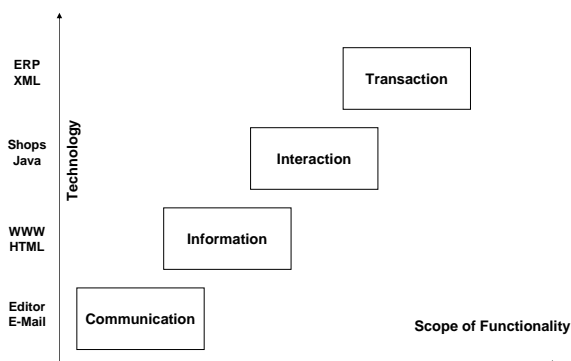
Any form of business operations between **any** two parties using **digital** communication **over open networks**, especially the Internet.

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

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

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Stages of E-Business



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

Cf. Thome/Schinzer/Hepp (2005)

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Electronic Business

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

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Example



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

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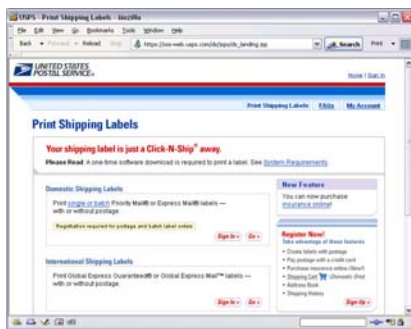
Example (2)



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

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Example (3)



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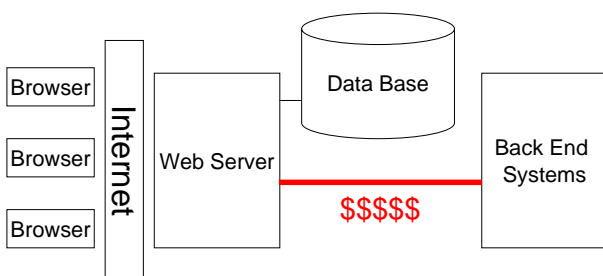
Example (4) Paper Media Integration



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Very Basic Infrastructure



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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)

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From “Make” to “Buy”

- Malone/Yates/Benjamin (1987!): “Electronic Markets and Electronic Hierarchies”
 - 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)

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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

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Assignment for Next Week

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

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

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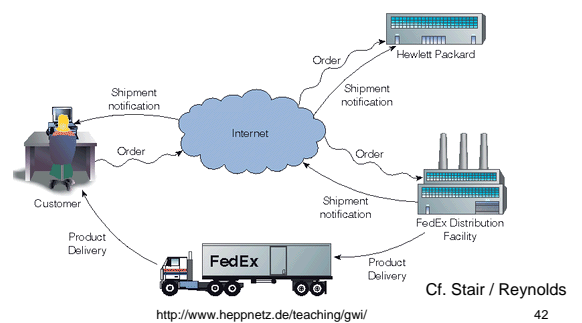
Thank you!

The slides and additional materials will be available at

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

Bonus Track ☺

E-Business: Delivery of Tangible Goods



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

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Reach



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

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Make Your Customers Part of Your Business



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Thank you!

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