

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

Assignment from Last Week

- WI1, 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

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?

Paint Station

400 sqft/hour

Drilling

100 holes/hour

Welding

100 inches/hour

Punching

20 inches/hour

Assembly

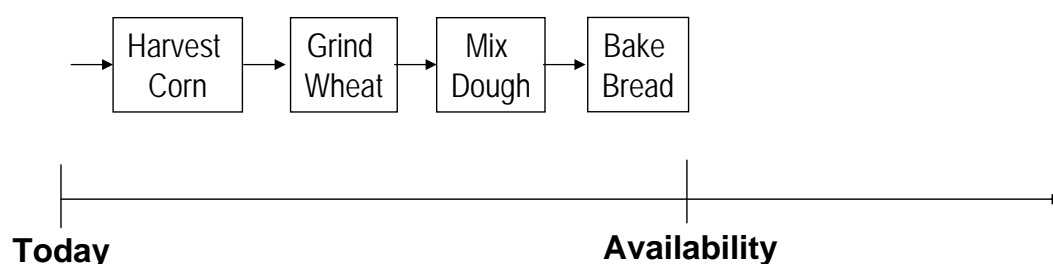
200 assembly tasks /hour

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Forward Scheduling

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

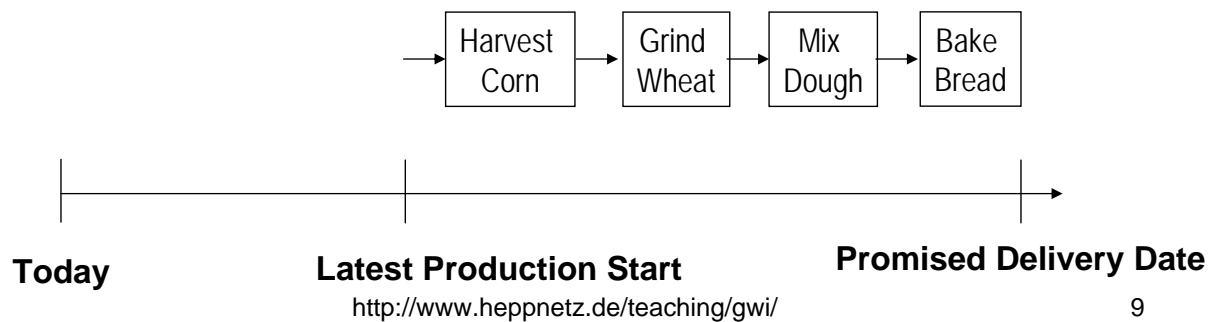


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Backward Scheduling

Goal: Determine latest production start for a given delivery date



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Structure of the Unit

- Overview
- Manufacturing Resource Planning (MRPII)
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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.

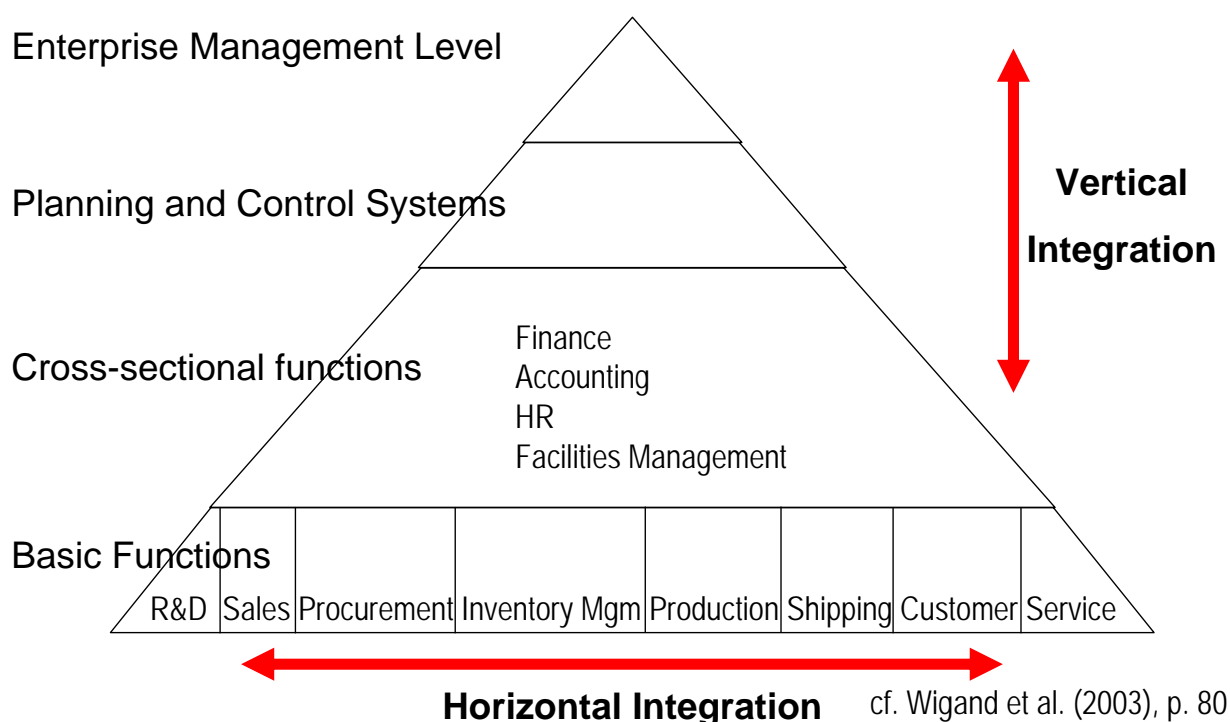
But:

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

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Process Integration



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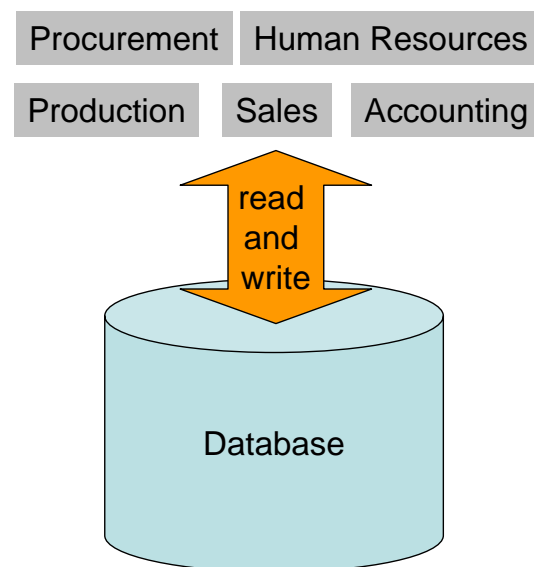
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The Idea of Enterprise Resource Planning (ERP)

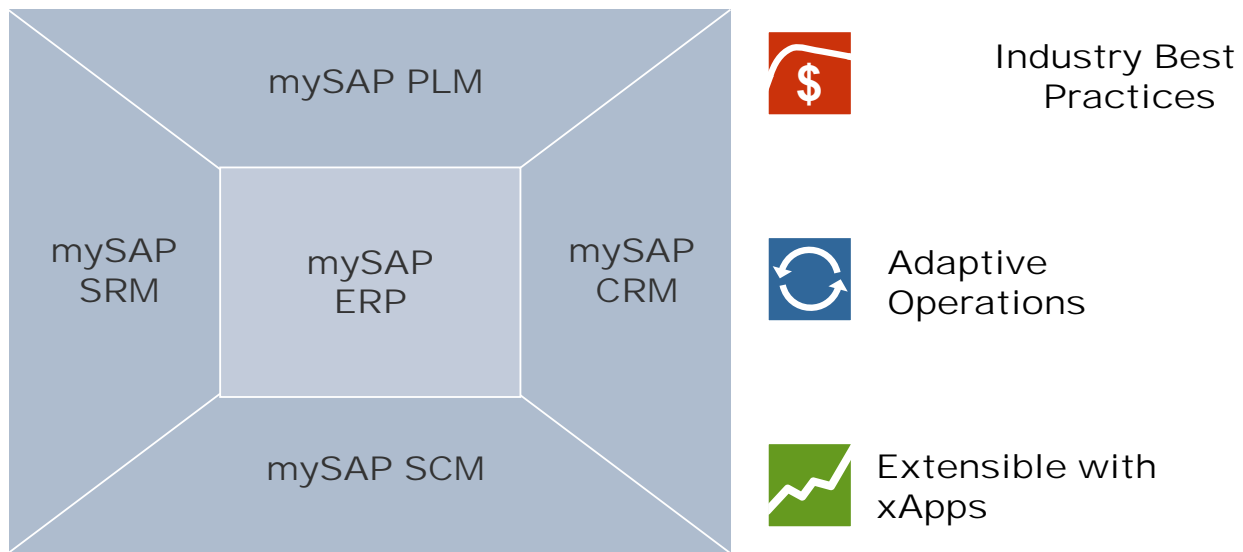
- Planning of the usage of resources *from the perspective of the overall enterprise.*
- Capital, machinery, parts, human resources,...
- Usually on the basis of ERP *software*

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>

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

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Advantages of ERP

- Eliminates costly, inflexible legacy systems
- Improved technology infrastructure
- Improved work processes
- Increased data access for decision making

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

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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>

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

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Structure of the Unit

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

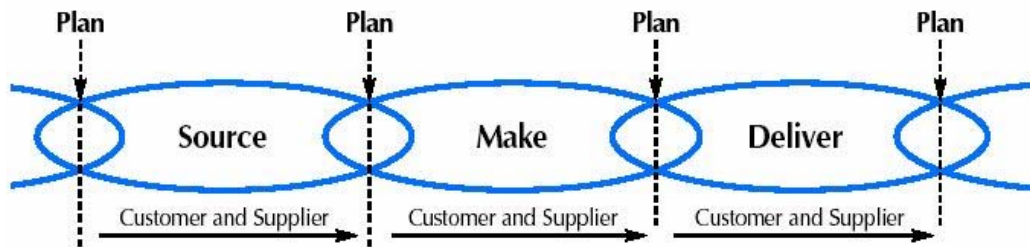
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Supply Chain

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

Configurability



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

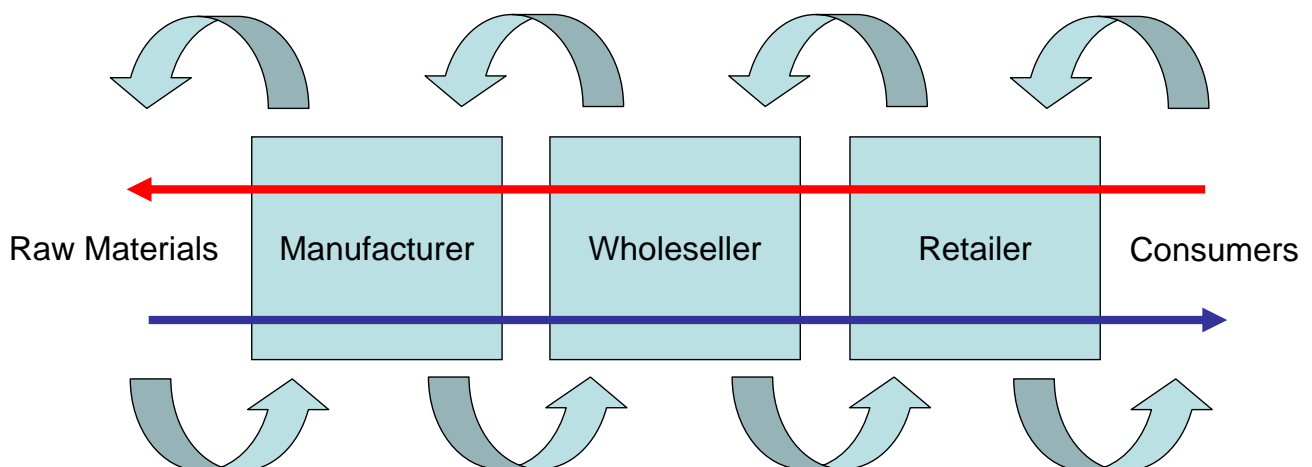
Planning processes manage these customer-supplier links

- ▶ 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

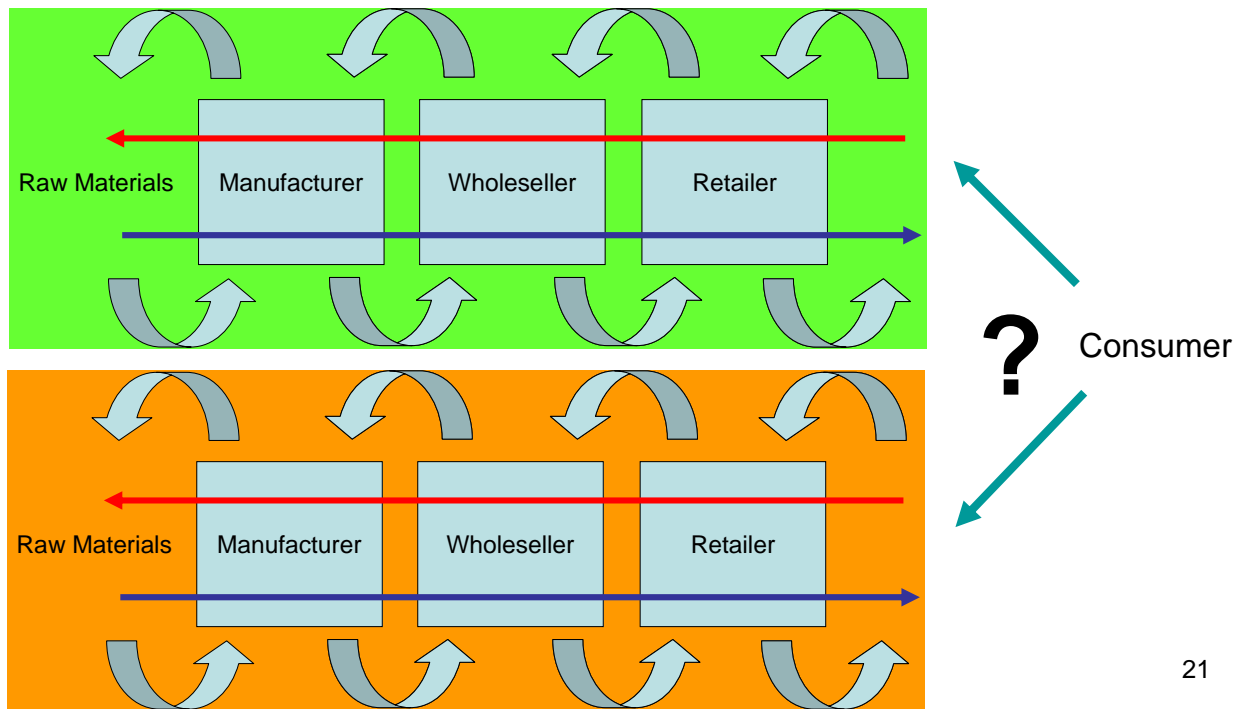


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Competition of Supply Chains:

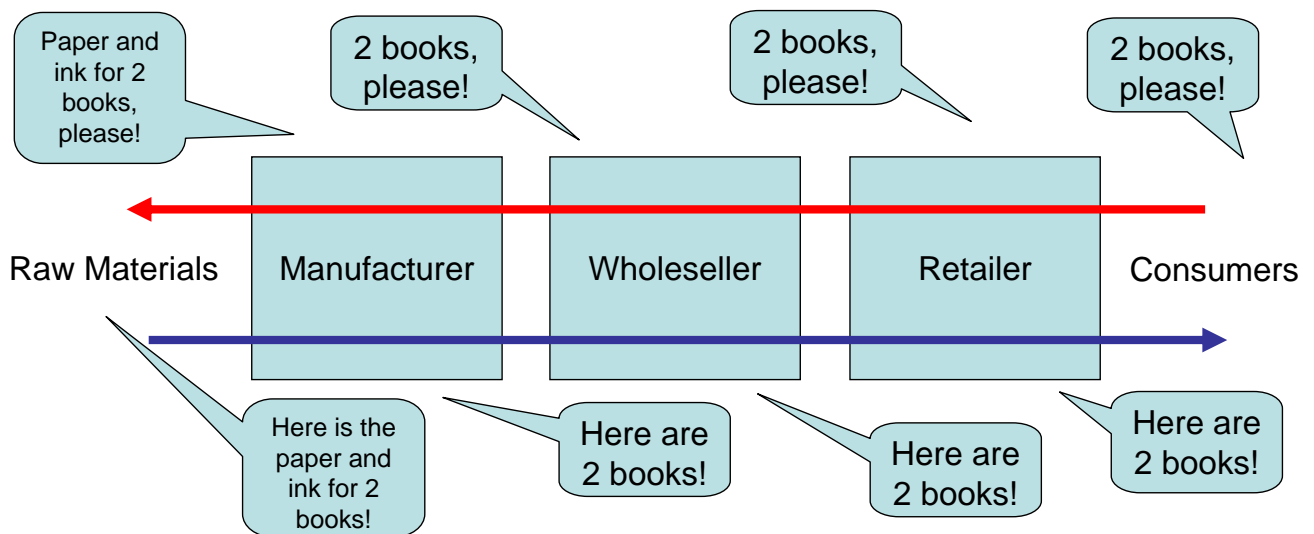
The competitiveness is determined by the overall performance of all partners in the chain



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The Bullwhip Effect

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

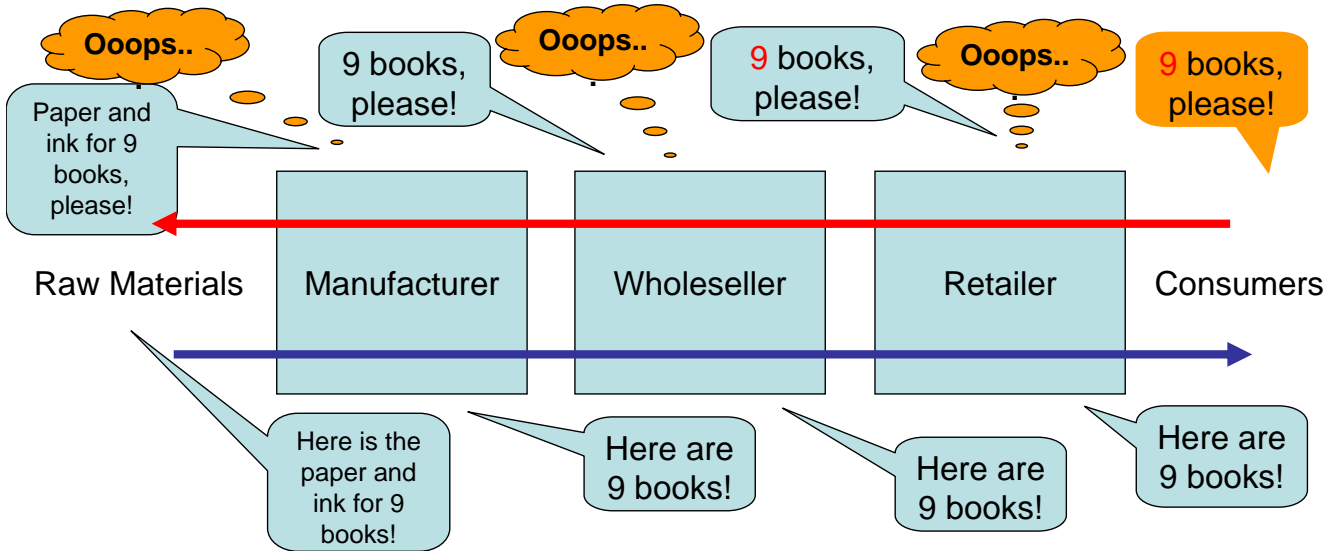


Forrester(1961): *Industrial Dynamics*

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

The Bullwhip Effect

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



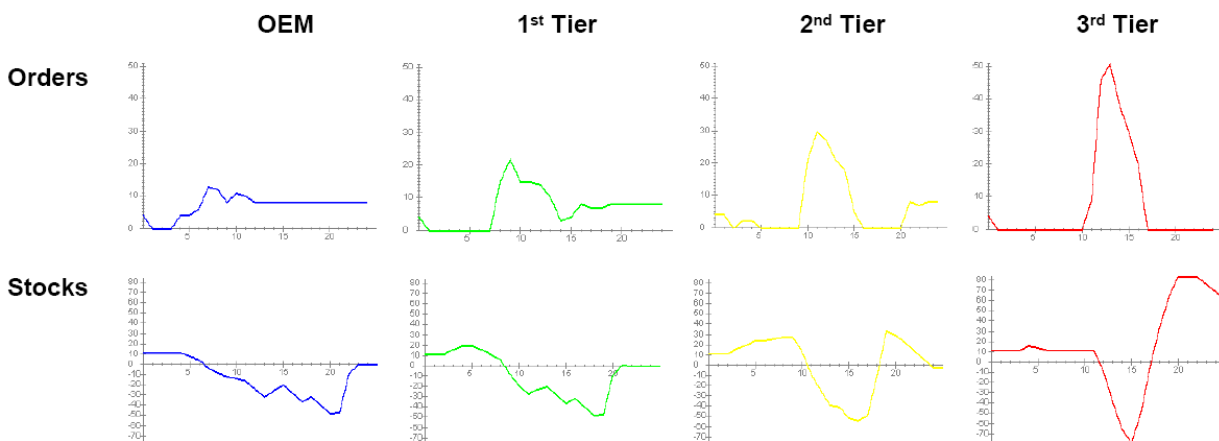
Forrester(1961): *Industrial Dynamics*

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

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The Bullwhip Effect



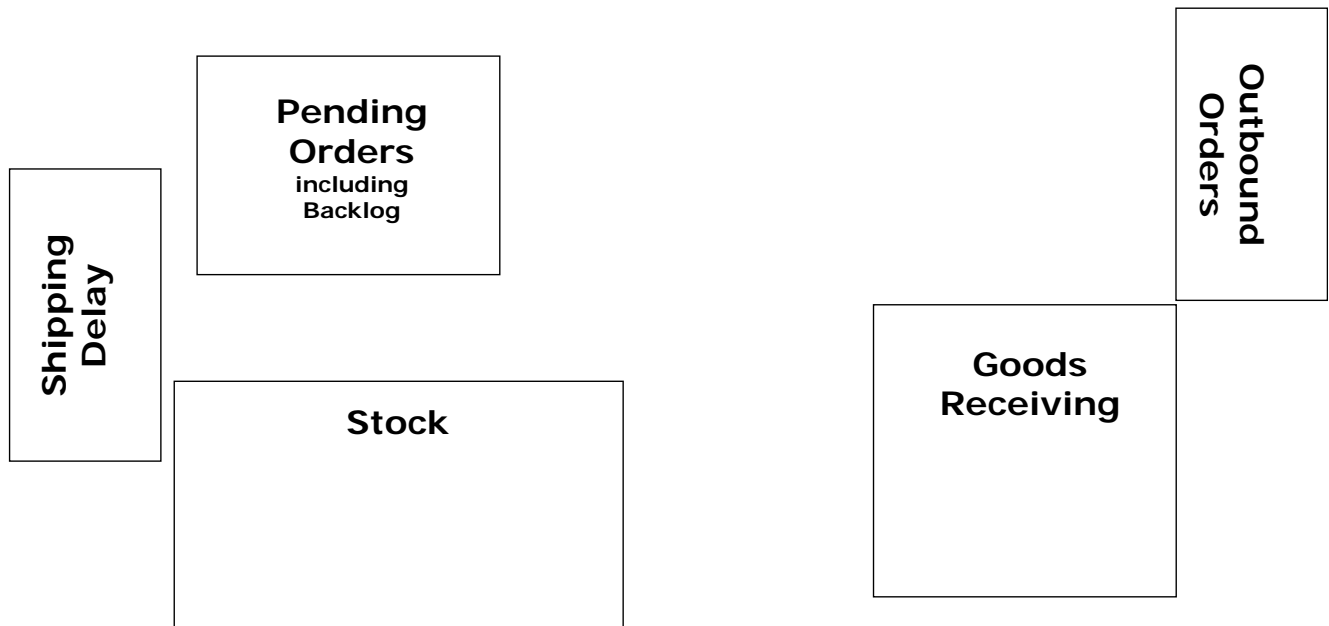
From: Nienhaus/Ziegenbein/Duijts (2002)

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The Beer Game

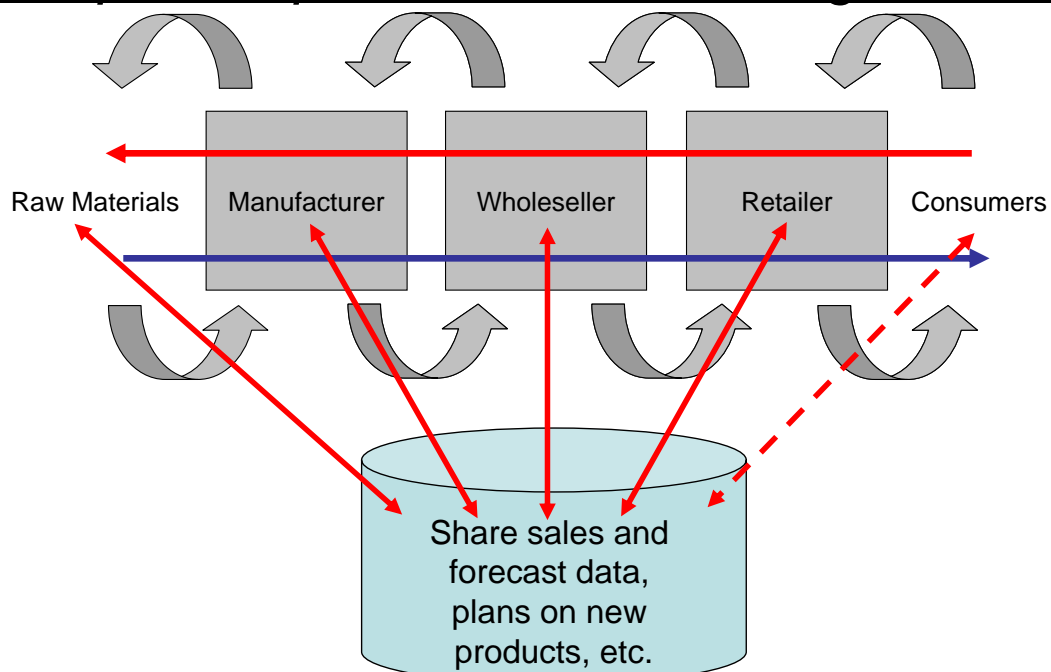
Online Beer Game: <http://www.beergame.lim.ethz.ch/>



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

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



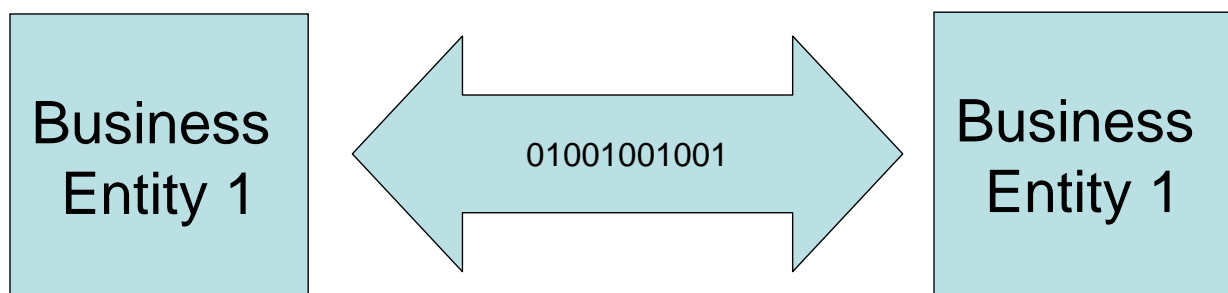
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Structure of the Unit

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

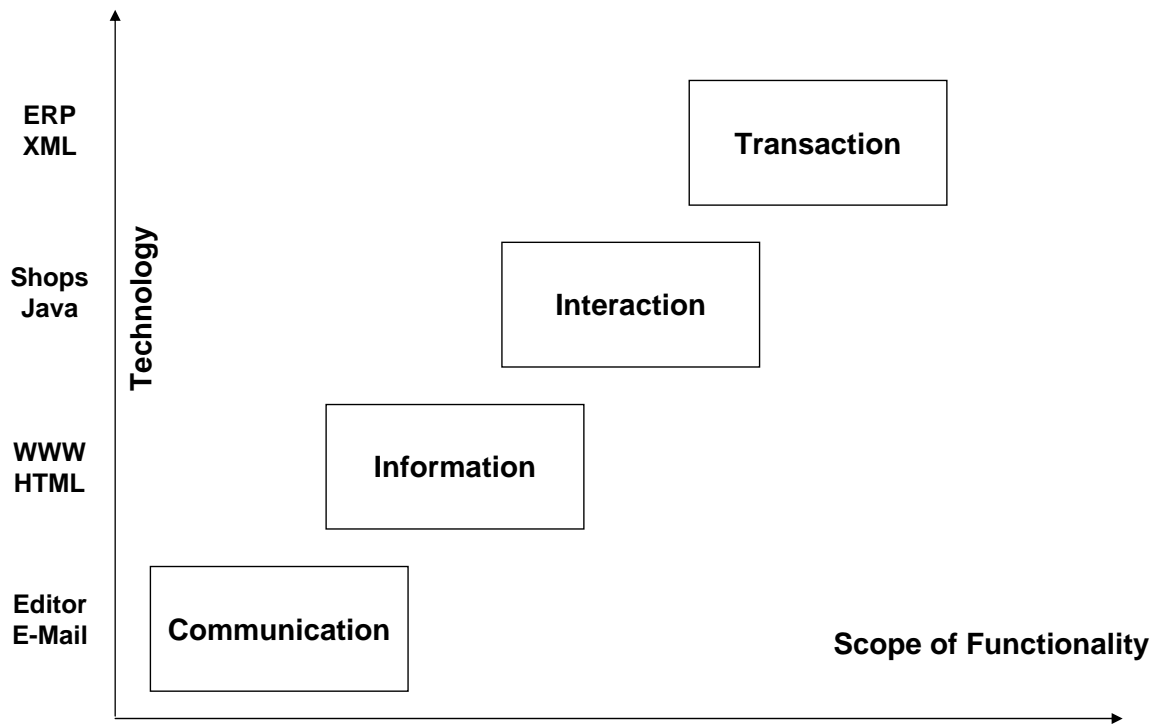
What is E-Business?



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)

Stages of E-Business



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

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Cf. Thome/Schinzer/Hepp (2005)

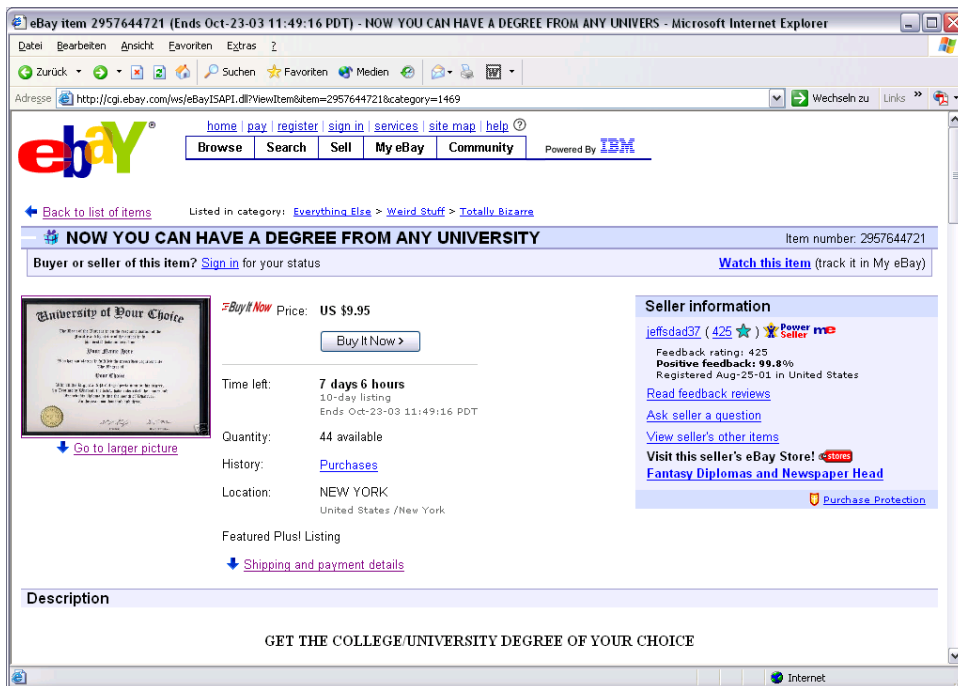
Electronic Business

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

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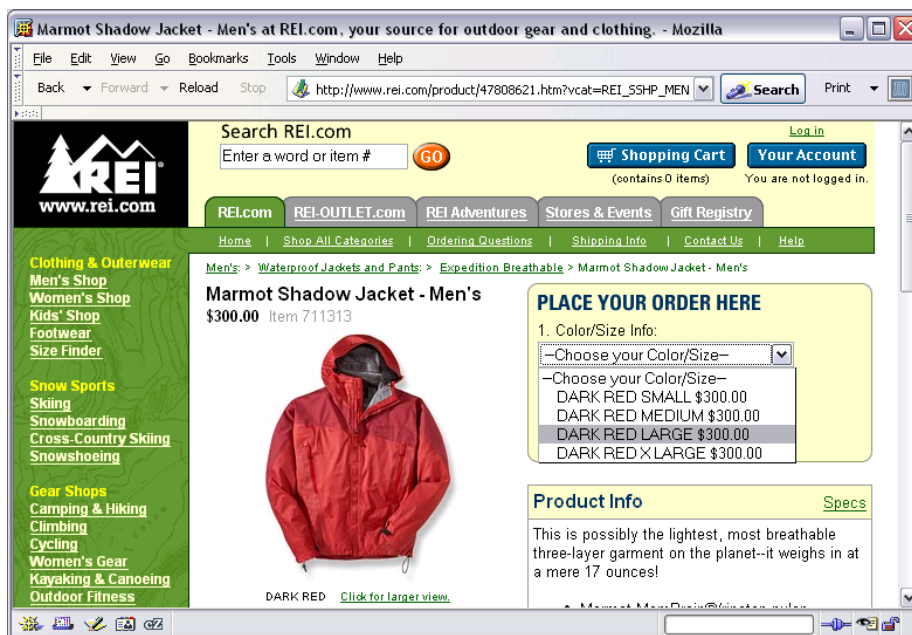
Example



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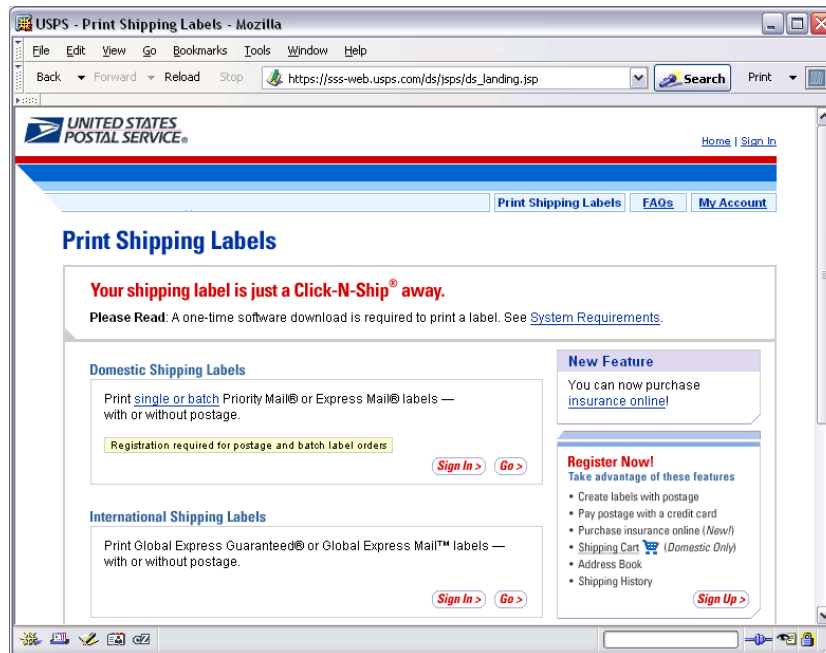
Example (2)



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

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Example (3)



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

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Example (4)

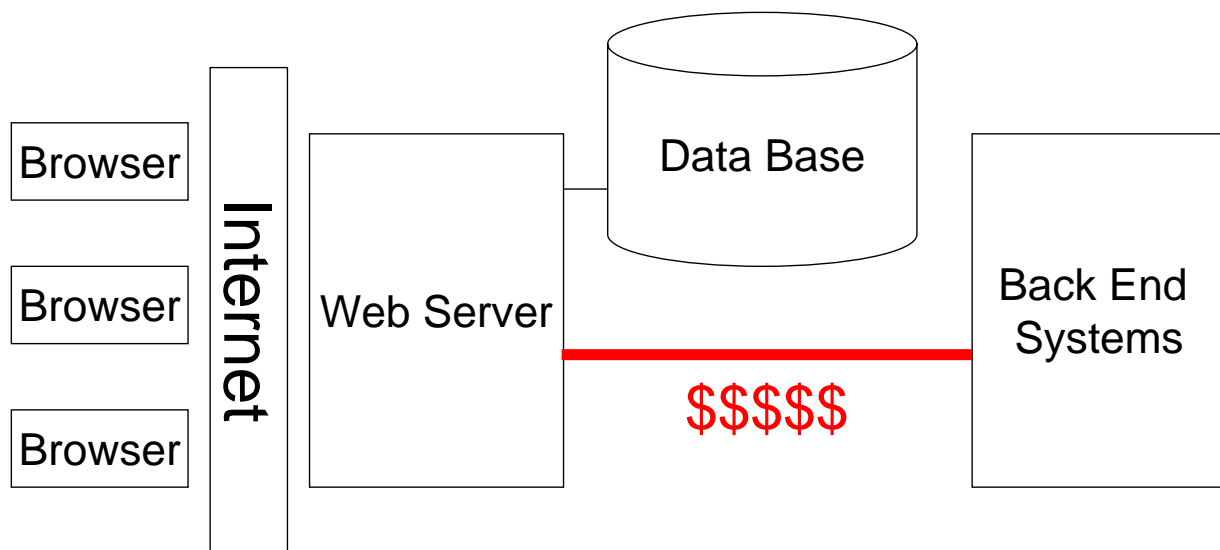
Paper Media Integration

The coupon is titled "MoversGuide Online Coupon" and expires on 05/30/2004. It features a large "10% Off" in blue text, with the subtext "Your next purchase up to \$2000*". Below this, a blue banner reads "Appliances, paint, flooring or anything else for your new home!". A detailed disclaimer states: "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(TM), Gemini(TM) and Wide-By-Side(TM) refrigeration lines of major appliances. Also, not valid on Viking appliances in Nevada stores." The coupon includes the Lowe's logo with the tagline "Improving Home Improvement" and a photo of a dining room. At the bottom, it says "EMPLOYEE BAR CODE INSTRUCTIONS: At any time during the transaction, please scan the bar code." followed by a barcode and the number "470003080705327".

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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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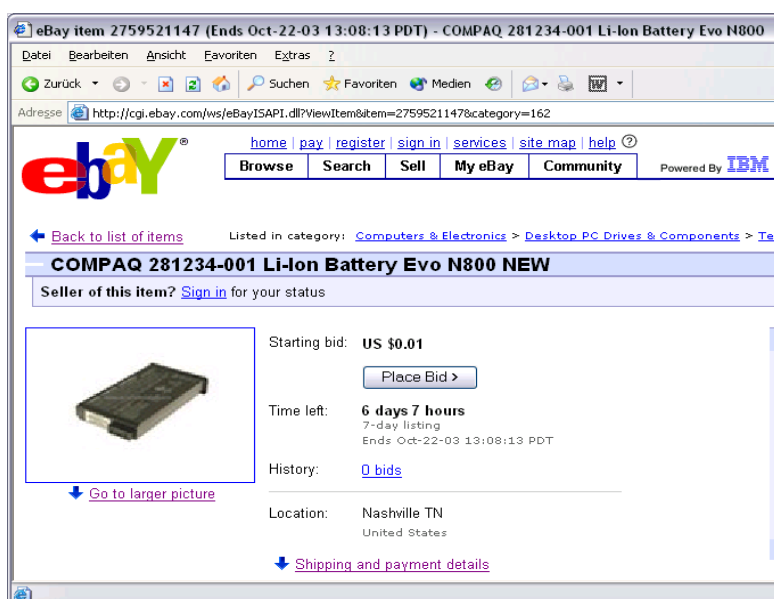
From “Make” to “Buy”

- 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.

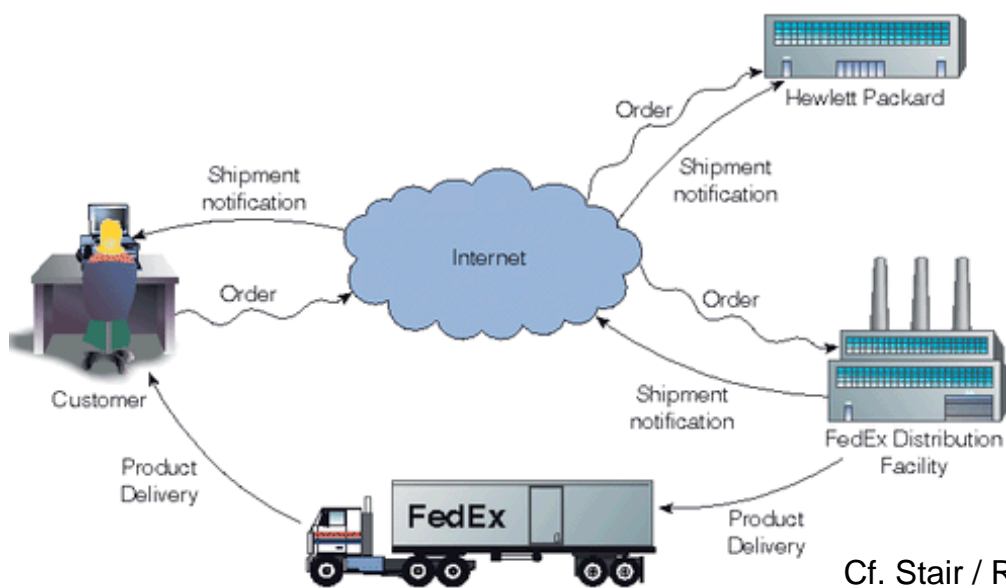
Thank you!

The slides and additional materials will
be available at

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

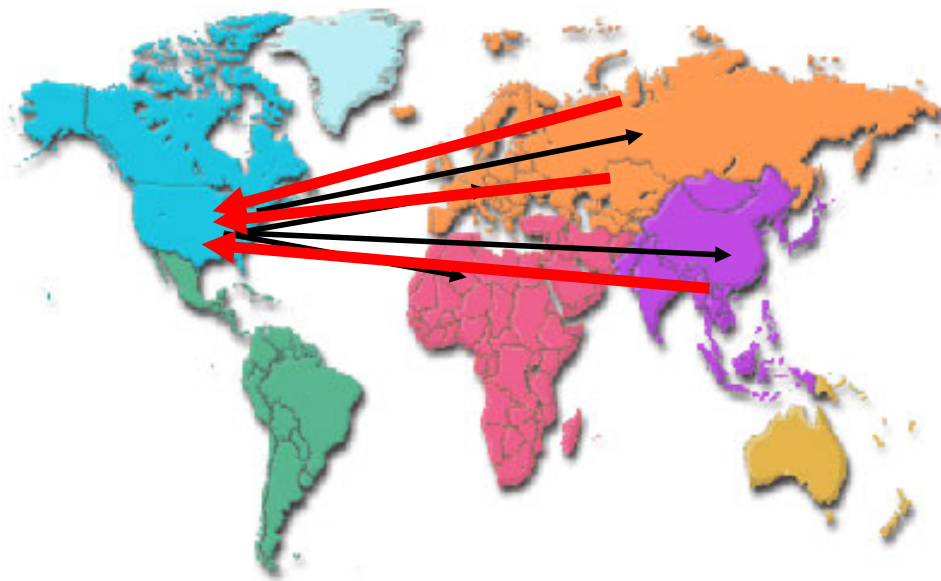
Bonus Track ☺

E-Business: Delivery of Tangible Goods



Cf. Stair / Reynolds

Reach



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

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Make Your Customers Part of Your Business



www.heppnetz.de/teaching/

Thank you!

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