

Einführung in die Wirtschaftsinformatik *Business Information Systems*

Prof. Dr. Martin Hepp
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mhepp@computer.org

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

About the instructor: Martin Hepp

- Professor of computer science and head of the research unit „Semantics in Business Information Systems“ at DERI, University of Innsbruck.
- Ph.D. in Management Information Systems, Bayerische Julius-Maximilians-Universität, Würzburg, Germany (2003); M.B.A., ditto, Würzburg, Germany (1999)



See <http://www.heppnetz.de> for current papers and presentations.

Learning Goal

- Learn to **use** Computer Technology **effectively and efficiently** for business purposes.
- **Understand** the transformation of the business world currently in progress and look behind the buzzwords.
- Be well prepared for a career in the dynamic, global economy.

Logistics

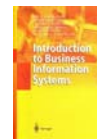
- **Lecture**
 - Wednesdays, 10:15-**12:00**, HS 11
- **Exam: At the end of the semester**
 - To be announced
- **No classes on Nov 21 and December 5!**
Instead, all future lectures will be 15 minutes longer, i.e. from 10:15 - 12:00.

Office Hours and Contact

- By appointment only
- mhepp@computer.org

Learning Resources

- **Mandatory**
 - Wigand/Mertens/Bodendorf /König/Picot/Schumann: „Introduction to Business Information Systems“ Springer, 2003
- **Recommended for German native speakers**
 - Hansen/Neumann: Wirtschaftsinformatik 1
 - Hansen/Neumann: Wirtschaftsinformatik 2



Learning Resources (2)

- Course Web page
 - <http://www.heppnetz.de/teaching/bis/>
 - **Not yet online**, but within this week
- All slides will be put on-line *after* the lecture
- Some materials may be password protected
 - User: uibk
 - Password: uibk2007

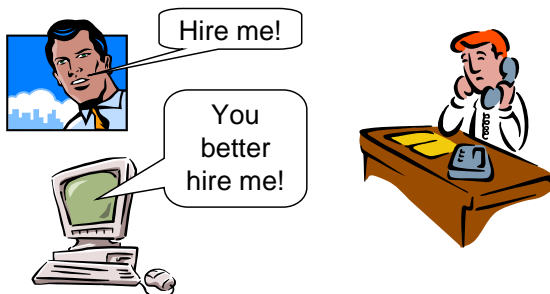
Structure of the Lecture

- **Unit 1:** Introduction
- **Unit 2:** Economics for CS Students
- **Unit 3:** Business Management for CS Students
- **Unit 4:** Input and Output Devices / RFID
- **Unit 5:** Software
- **Unit 6:** Networks, Data Interchange, and the Internet
- **Unit 7:** Design, Development, Deployment, and Operations of Information Systems
- **Unit 8:** Office and Enterprise Applications
- **Unit 9:** Supply Chain Applications and E-Business
- **Unit 10:** Management Support Systems
- **Unit 11:** Content Integration and E-Procurement
- **Unit 12:** Semantic Business Process Management
- **Unit 13:** Exam Review

Administrative Questions and Suggestions?

...why it is good that you are sitting here 😊

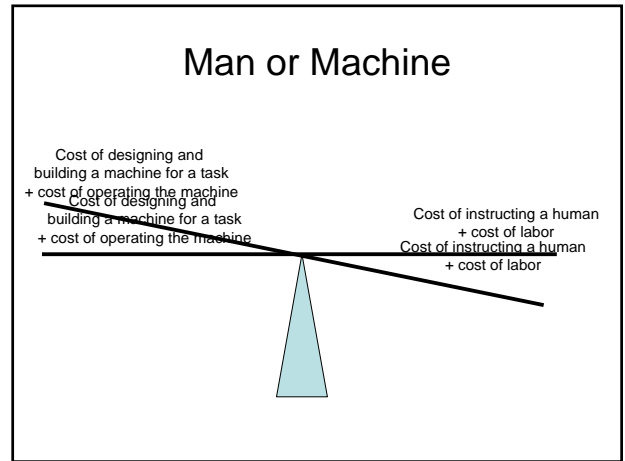
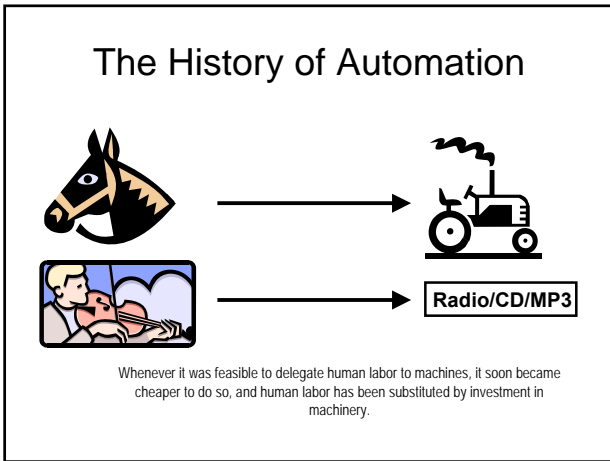
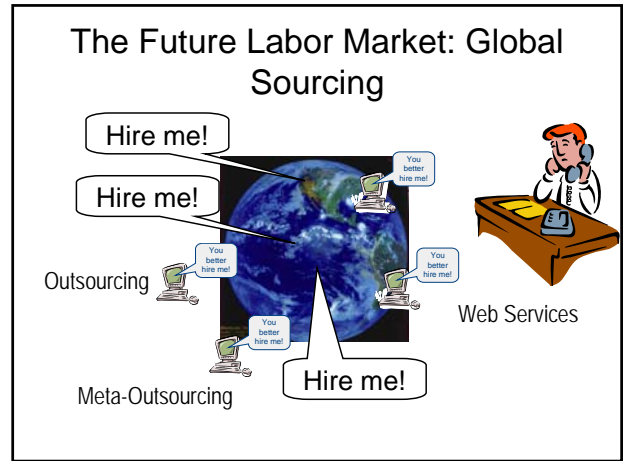
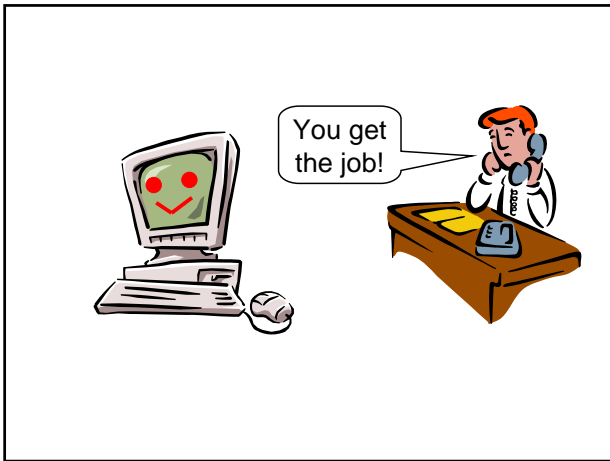
The Future Labor Market: General



My Competitive Advantages...

I need no food and work all night. I have no family life and won't ask for holidays.

Boring, repetitive tasks? Yeah – I like them! Just give me instructions once and I will be glad to do so exactly, whenever you want it.



Human Vs. Computational Intelligence

Based on a talk by Luis von Ahn, Carnegie Mellon University

- ### Dead and Semi-Dead Professions
- Bank Clerk
 - Yellow Pages
 - Music Store Sales Manager
 - Tax Consultant?
 - Financial Analyst?
 - Etc.

The fully automated bookstore

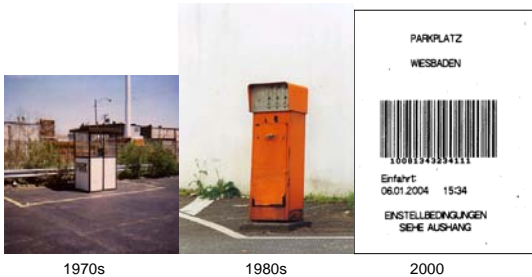


Pittsburgh or Philadelphia airport; I don't remember it anymore ©

Semi-automated Tax Consulting



Parking



1970s

1980s

2000

What Are Our Competitive Advantages?

Computer (so far) can't

- design,
- create,
- organize,
- maintain, or
- improve

computers and their usage.

A Great Chance for Your Career

- There is constant need for individuals who invent new ways to use computers for business purposes.
- This is an **interdisciplinary** challenge, requiring skills in both business and computer technology.

Computer Skills + Management Skills \neq
Computer Information Systems Skills

Information Systems: Understanding and Exploiting Mutual Effects

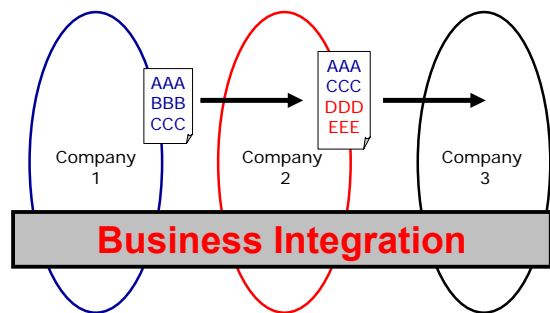
- IT
- Organization

Typical Challenges

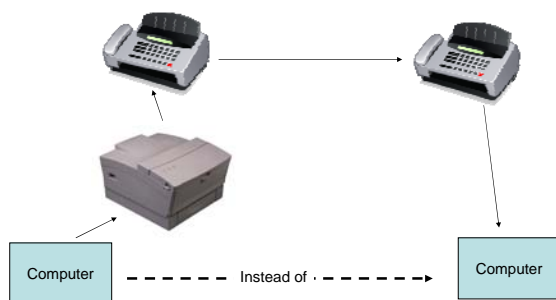
- Programming vs. COTS
- Human vs. Computational Intelligence
- Integrated Information Flow in Value Chains

What is it all about?

Key Goal in Information Systems:



Media Break



Eliminate Manual Data Entry



Automatic propagation of information
along the value chain **without any media**
break.

Three Reasons and Their Ranks

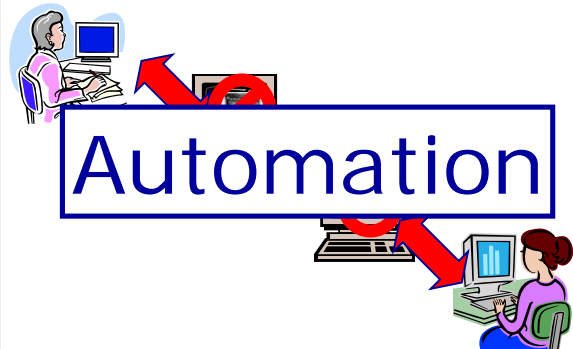
1. Consistency

2. Timeliness

3. Cost Reduction

Automatic propagation of information along the value chain
without any media break.

True Goal



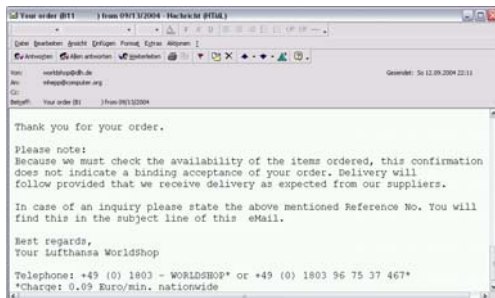
Integrated vs. Fragmented Processes



Integrated Value Chains



Fragmented Value Chain



What's that?



Automated Data Capture
+ Integration with other data

Better Business Decisions

Example 1: Auto-ID Revisited



Example 1: Auto-ID Revisited Paper Media Integration

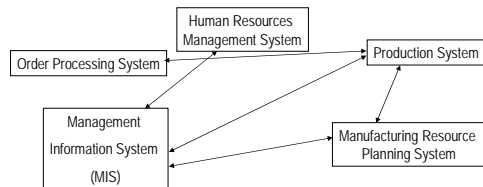


Example 2: Ticketing

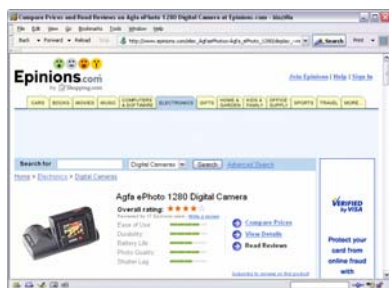


Integrated / Integration

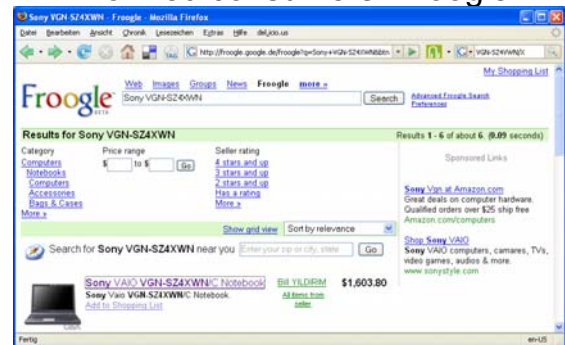
- The key term is „Integrated Information Systems“
- Integrated basically means „putting together parts that belong together“.
- Integrating Systems is a prerequisite for automation and a core activity in the context of Business Information Systems.



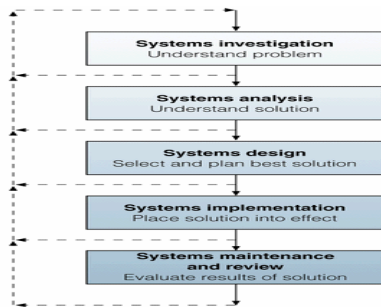
Living on the Fast Track: Shorter Feedback Cycles



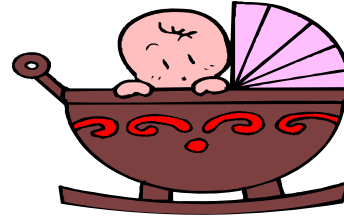
No shop can survive just on badly informed consumers: Froogle



Traditional Systems Development



The Cradle Building Problem



Not from Scratch / Legacy

- There exist systems in the environment that cannot be simply replaced, for technical or economic reasons
- Those systems are often badly documented and running on outdated platforms using outdated programming languages etc.



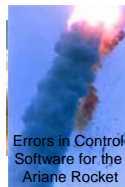
Moving Target / The Shepherd's Problem

- Systems have an individual path of evolution
 - data formats
 - internal representation
 - business logics



Status Quo: Lack of Formal Semantics

Planungspanne: Rheinbrücke mit Treppe - 54 Zentimeter...
 File Edit View Go Bookmarks Tools Help
 http://www.spiegel.de
 Getting Started Latest Headlines
 SPIEGEL ONLINE PANORAMA
 Ressort wählen Übersicht
 Home > Panorama
 14. Januar 2004
 PLANUNGSPANNE
 Rheinbrücke mit Treppe - 54 Zentimeter Höhenunterschied
 Der Name für die neue Rheinbrücke stand schon fest: "Hochrheinbrücke" sollte die Verbindung zwischen dem deutschen und dem Schweizer Teil der Stadt Laufenburg heißen. Nur befahren kann sie derzeit niemand - das ausführende Ingenieurbüro legte eine Seite der Brücke ganze 54 Zentimeter zu tief an.



Errors in Control Software for the Ariane Rocket

CH: Altitude relative to the sea level of the Mediterranean Sea.
 D: Altitude relative to the sea level of the North Sea.
 Gap: 27 cm

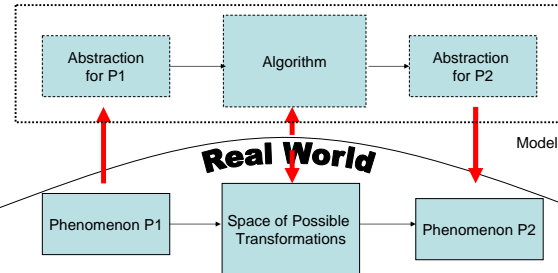
$$27 - (-27) = 54 \text{ cm}$$

Assignment for Next Week

- Get the books
- Review the slides
- Read the following paper
 Leonard E. Read: "I, Pencil. My Family Tree as told to Leonard E. Read", Dec. 1958
<http://www.econlib.org/library/Essays/rdPnc1.html>,
 PDF version:
<http://www.fee.org/pdf/books/I.%20Pencil%202006.pdf>

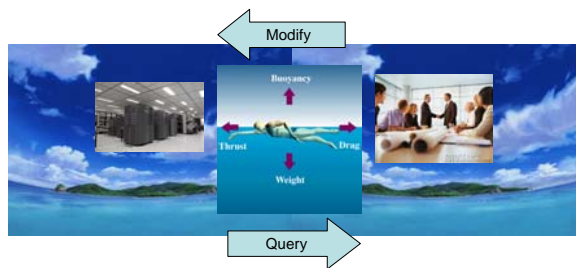
Why is it difficult to use computers for business purposes?

Computer Systems, Models, and the Real World



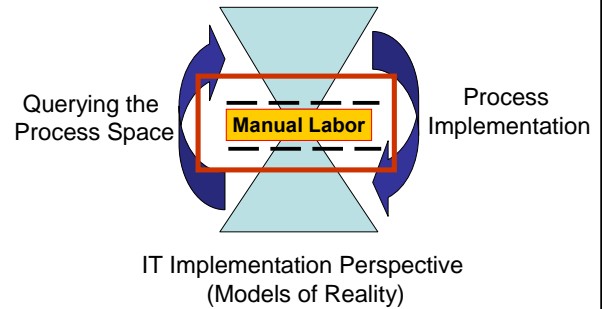
Two Lonesome Islands

Actual Process Space (determined by processes materialized in IT) Managerial View on the Operation of an Enterprise



The Critical IT / Process Divide

Business Experts' Perspective ("Reality"?)

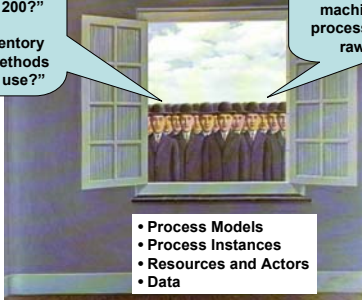


Querying the Process Space

"Do we have a cost approval process for items below \$ 200?"

"How many inventory management methods are currently in use?"

"In which of our food manufacturing machines are we processing meat or raw eggs?"



Manipulating the Process Space

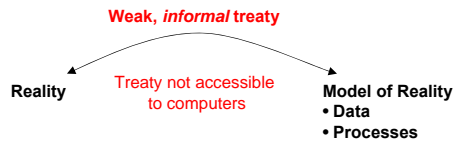
"We need to set up a billing process for our new Internet TV service"

Programming

(Web) Service Composition and Orchestration

Customizing of COTS Packages (e.g. SAP)

The Root of the Problem: *Weak Ties between Reality and Abstractions of Reality*



Symptoms:

- We can hardly validate whether a given ER model is correct
- We face difficulties making sure that the customization of SAP myERP matches the business needs of a given enterprise

IT represents reality and is part of reality



Reality := Reality + (relevant) Models of Reality

Thank you!

The slides and additional materials will
be available at

<http://www.heppnetz.de/teaching/bis/>
shortly.