

Grundzüge der Wirtschaftsinformatik *Introduction to Business Information Systems*

Unit 11

Prof. Dr. Martin Hepp
<http://www.heppnetz.de>
mhepp@computer.org

<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 Information Systems](#)
- Unit 12:** Exam Review

Assignment from Last 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.

Link to the Previous Unit

- **Last Unit:**
 - 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?
- **Today:**
 - How are the information needs of the various levels of management different from those at the transactional level?
 - What types of software and techniques are used for supporting managerial decision making?

Structure of the Unit

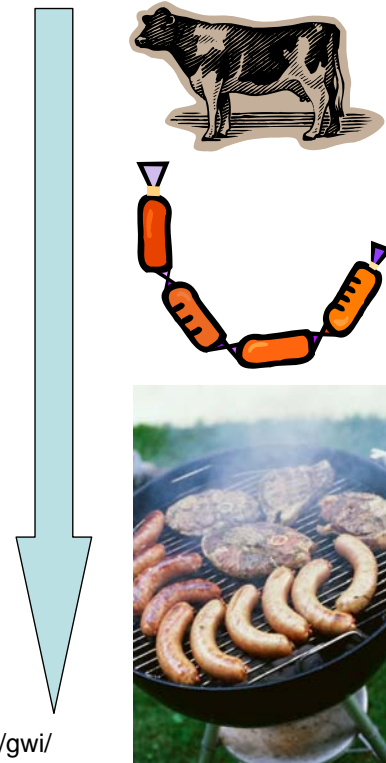
- Overview and Examples
- Query and Reporting Systems
- Management Support Systems
- Executive Information Systems
- Data Storage and Processing

Information Needs of the Management

- Top Management: Strategic decisions
 - High impact
 - High degree of uncertainty
 - Medium to long-term
- Middle Management: Implementing strategy
- Operational Management: Recurring decision-making on similar issues

Example: Sausage Factory

- **Task:** A sausage factory must decide about one week in advance how many fresh sausages will be sold the upcoming Saturday
- **Problem:** The actual sales will depend on a complex blend of variables
 - Weather
 - Public holidays
 - Sports events

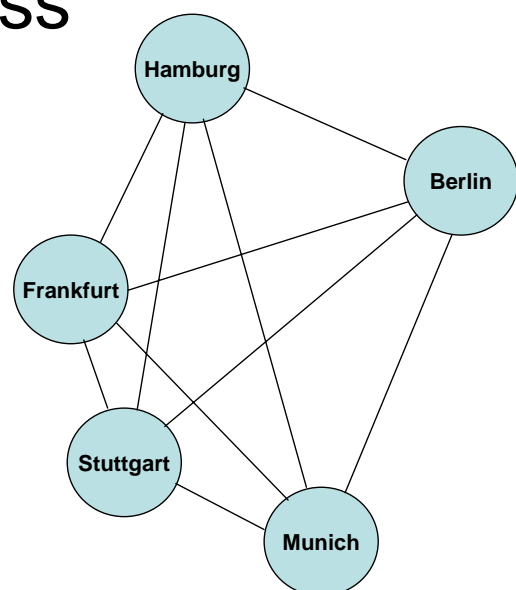


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Example: Routing in Transport Business

- **Traveling Salesman Problem (TSP):**
If a salesman starts at a given city, which one is the shortest roundtrip through a set of cities, given that the distance from any city to any other one is known
- **Extensions**
 - Capacity constraints
 - etc.



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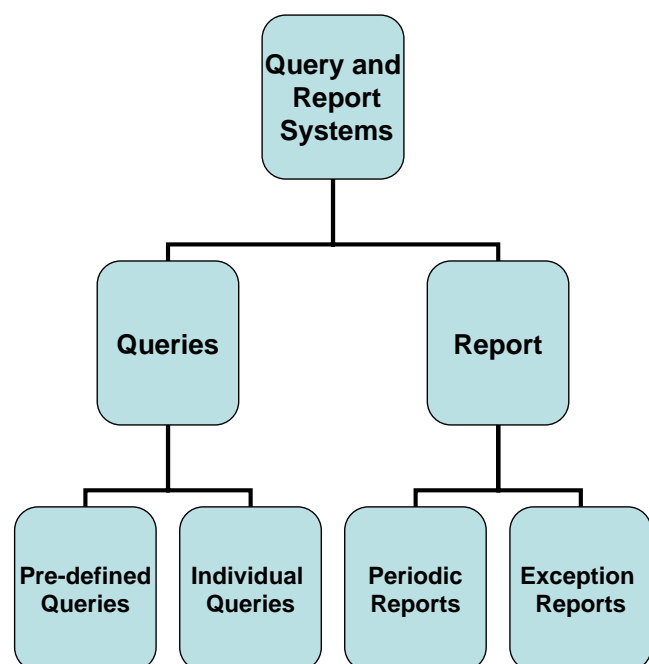
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Query and Reporting Systems

- **Query:** Specification of a question to be sent to a database
- **Report:** Selection and presentation of a set of interesting facts, often periodically



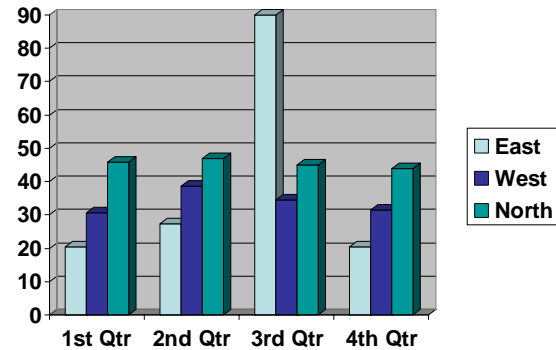
(Cf. Hansen/Neumann; Gluchowski et al.)

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Periodic Reports

- Pre-defined, highly structured types of reports that are generated automatically at regular intervals.
- Examples:
 - Sales overview
 - Financial



Exception Reports

- Reports that are generated automatically **if** certain **parameters exceed pre-defined** upper or lower **limits**

Customer Credit Line Exceeded!

Customer: Peter Miller
Approved Credit: \$ 5.000
Current Balance: \$ -5,350

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Management Support Systems

- Decision Support Systems
- Analytical Information Systems

Decision Support Systems (DSS)

- Supports domain experts in decision-making in complex scenarios
 - Many relevant variables
 - High degree of uncertainty

Key Performance Indicators (KPI)

- Single values or ratios that carry a lot of information on the state of business affairs.
- Examples:
 - Total sales per day
 - Defective parts ratio
 - Turnover per staff member
- SMART Guidelines
 - **S**pecific
 - **M**easurable
 - **A**chievable
 - **R**esult-oriented
 - **T**ime-based
- Benchmarking: Comparing your own performance with other companies that run similar processes

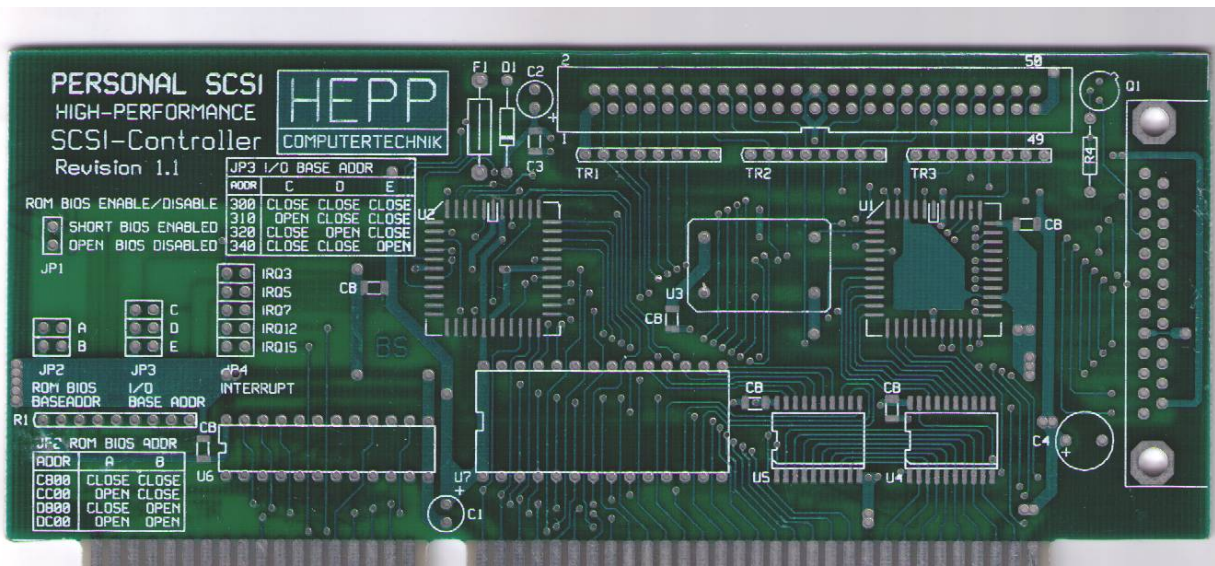
Forecasting

- Predicting a future state or variable based on
 - experience,
 - data from the past, or
 - simulation.
- Examples:
 - **Sales forecast:** How many sausages will be sold next Saturday?
 - **Price forecast:** How much will a barrel of oil cost in 10 months?
 - **Quality forecast:** How many defective parts will we have to handle if we sell 1000 computers this week?

Simulation

- Analysing complex systems by computing the system behavior for selected input variables

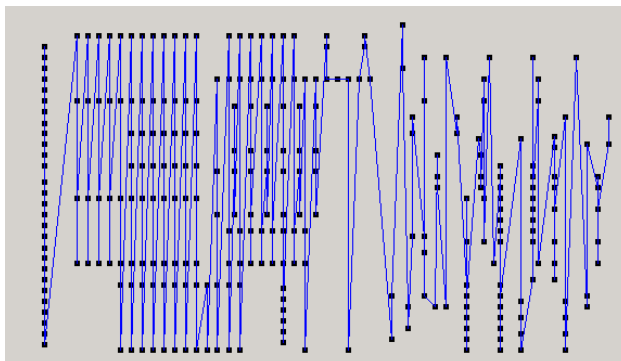
Example: Tool Path Optimization (1)



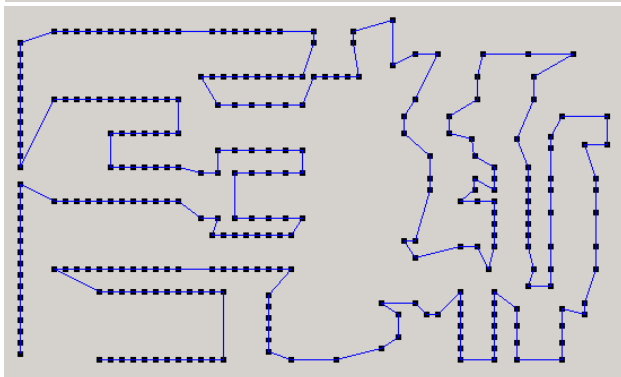
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Example: Tool Path Optimization (2)



Simple ordering of hole coordinates by X- and Y-axis.



Same layout – optimized for shortest tool route:
80% shorter -> ~ 80% production time saved

Examples (C) 2004 by Paul McGuire, taken from <http://www.geocities.com/ptmcg/drill/index.html>

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Example: Retail Shelf Management

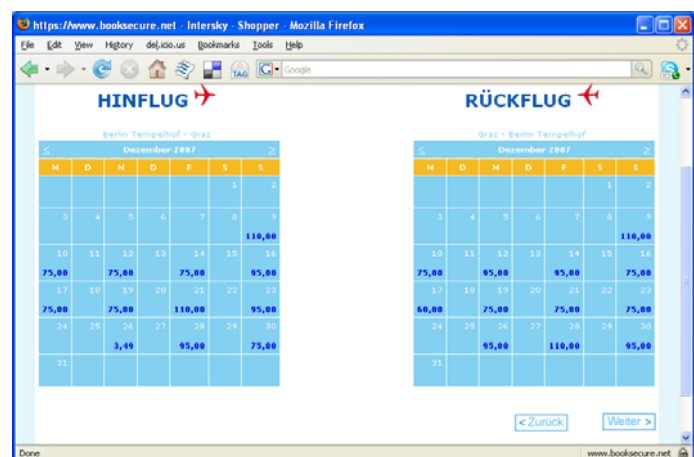
- How should the available shelf space be used, considering profit margins, consumer interest, etc.?



Planogram (C) Shelflogic,
<http://www.shelflogic.com/Gallery/plan8.jpg>

Example: Yield Management for Airlines

- At what price should you offer an available seat?
- Influenced by
 - General demand
 - Special events at target destination
 - Alternative travel connections
 - Etc.



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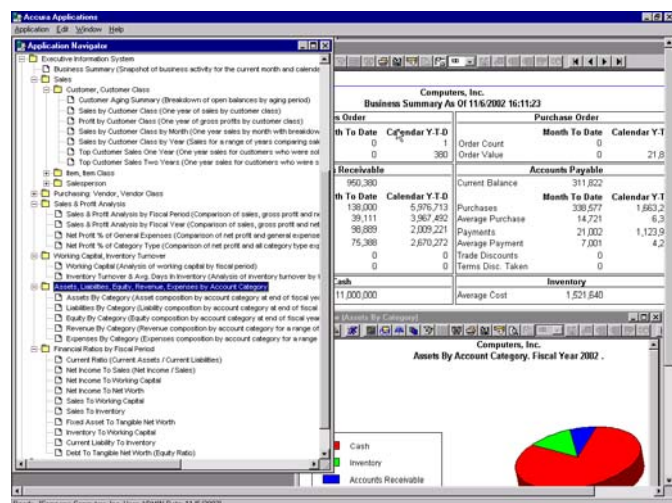
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Executive Information Systems

- Support systems for top-level management
- Query and report system, sometimes plus lightweight DSS
- Focus on „general business environment“ and KPIs
 - Financial state of the enterprise
 - Economic climate
 - Raw materials
 - Quality, capacities, pending orders



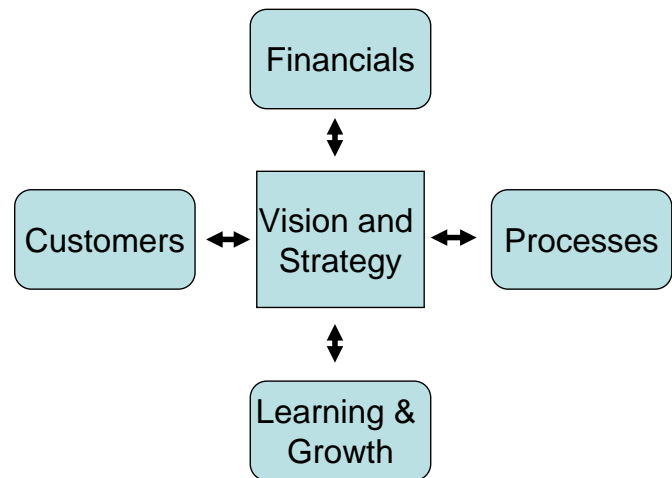
Screenshot (C) <http://www.accrasoft.com/>

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Balanced Scorecard

- **Idea:** Method for measuring whether the activities of an enterprise are meeting its strategic objectives
- Set of *Key Performance Indicators* (KPIs) for
 - Financials
 - Customer Relations
 - Internal Process Performance
 - Learning and Growth



Kaplan, R. S. / Norton, D. P.: *The Balanced Scorecard. Translating Strategy into Action*, Boston 1996

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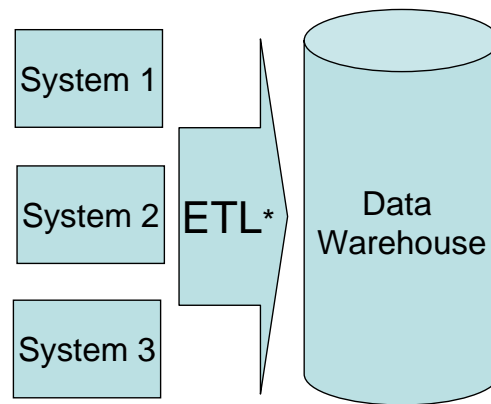
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Data Warehouse

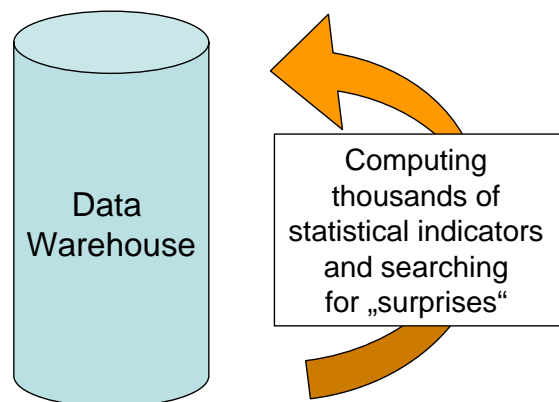
- **Idea:** Data from various transaction systems should be continuously copied to a persistent store
- **Motivation:**
 - Data changes, some types of analysis require comparison with previous states
 - Consolidated perspective
 - Analyzing the data should not delay operations



* ETL = Extraction, Transformation, and Loading

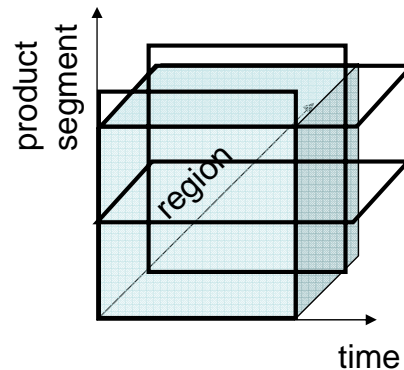
Data Mining

- Using statistical methods for spotting significant (i.e., surprising) patterns in data
- Can point to relevant and unknown information



On-Line Analytical Processing (OLAP)

- Ability to answer queries from various perspectives on large data warehouses
- Multi-dimensional databases
- Slicing, dicing, drill-down



Assignment for Next Week

- Review materials for units 1 – 11

Thank you!

The slides and additional materials will
be available at

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