Information Systems 2

Lars Schmidt-Thieme

Information Systems and Machine Learning Lab (ISMLL)
Institute for Business Economics and Information Systems
& Institute for Computer Science
University of Hildesheim
http://www.ismll.uni-hildesheim.de

J.C. Penney

The company J.C. Penney sells shirts through a network of local warehouses.

Formerly, it replenished sold items by stocking:

- Each warehouse stocks shirts for up to 3 month.
- Warehouses are supplied from regional storehouses that stock shirts for up to 6 months.

J.C. Penney

Nowadays, replenishing works completely different:

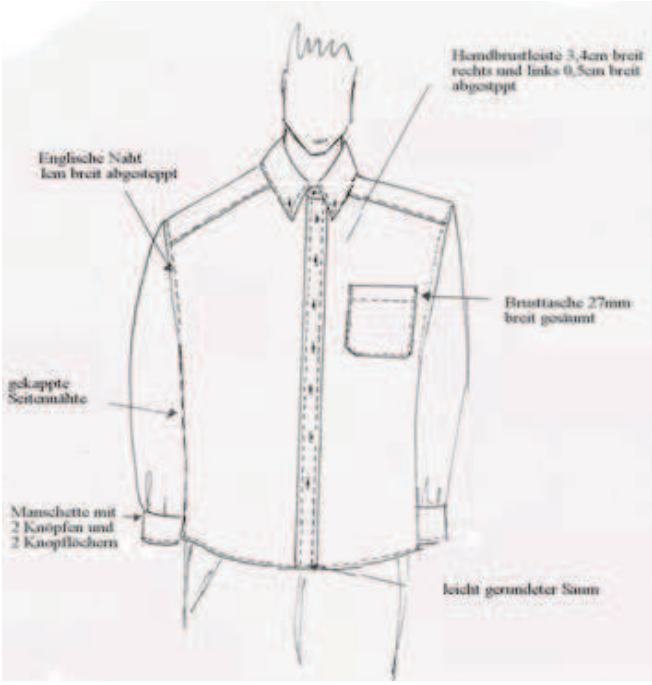
- At checkout each transaction is reported electronically to TAL Apparel Ltd. in Hongkong.
- TAL produces a new shirt like the one just bought and ships it directly to the local warehouse.
- TAL's application system uses the demand on different shirts in the past to predict the number of shirts needed in each store.
- TAL assigns article numbers and bar codes for easy identification of different shirts.
- TAL offers information about which shirts have been sent, when, and where they are right now.

J.C. Penney

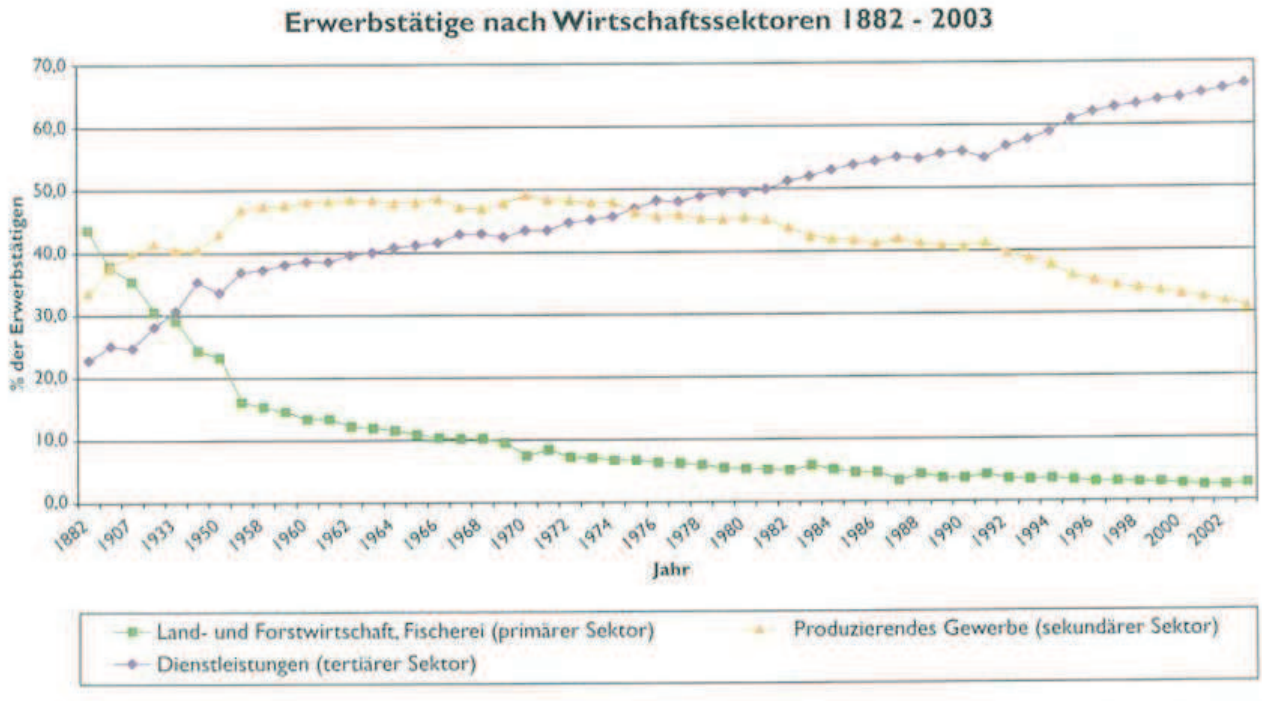
The new method for replenishing has side effects, e.g., for development and testing of new shirts:

- TAL produces a lot of variants (colors, sizes, shapes, etc.) and sents them directly to the warehouses.
- Penney can base their choices for new shirts on sales figures of the test shirts.

[LLS06]

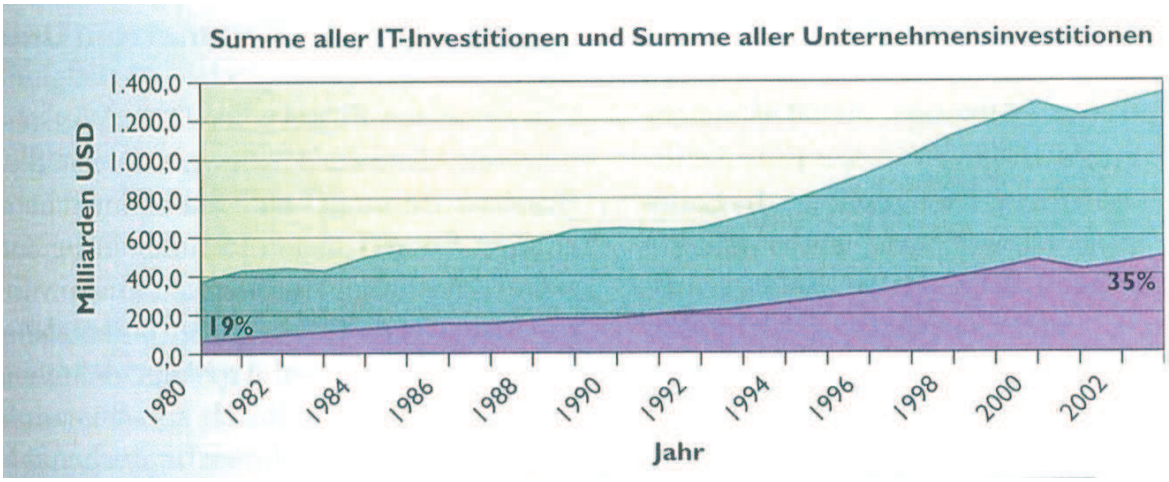


Information Technology in Business (1/2)



[LLS06]

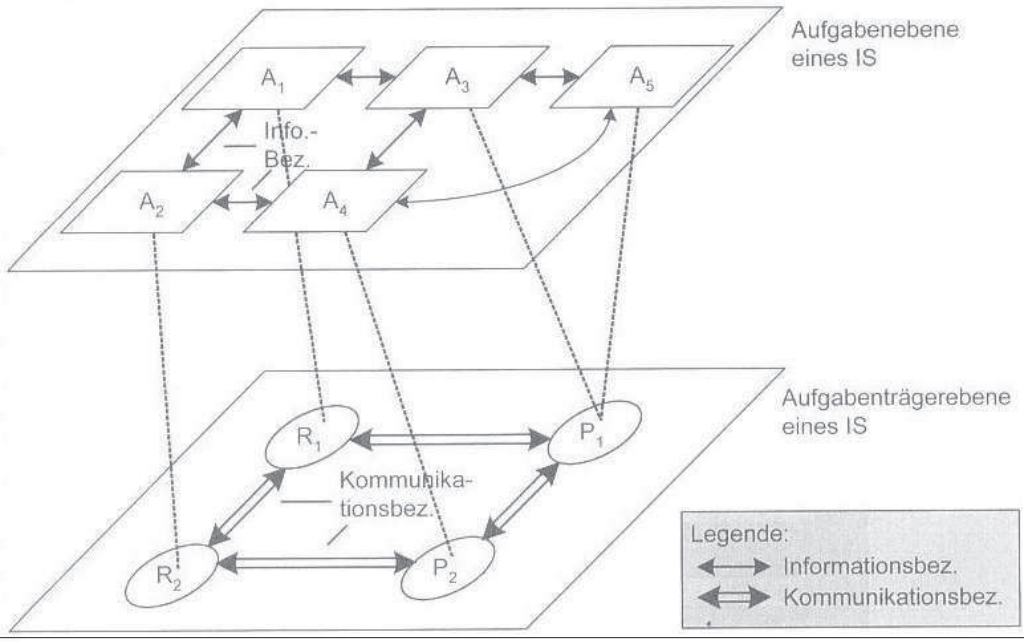
Information Technology in Business (2/2)



[LLS06]

Information Systems

"Unter einem Informationssystem [wird] ein System verstanden, das Informationen verarbeitet, d.h., erfasst, überträgt, transformiert, speichert und bereitstellt"[FS06, p.



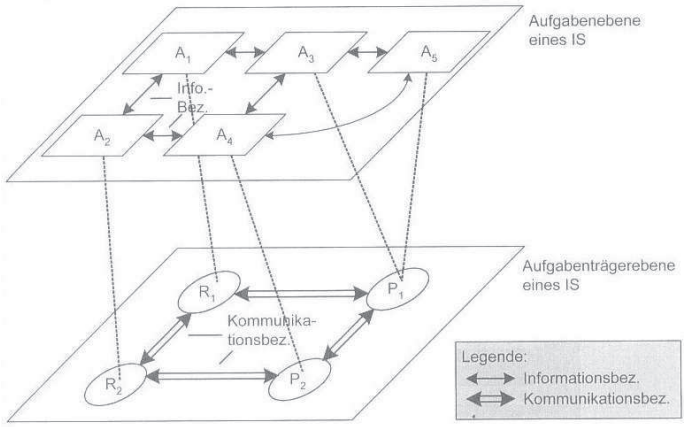
Information Systems

"Unter einem Informationssystem [wird] ein System verstanden, das Informationen verarbeitet, d.h., erfasst, überträgt, transformiert, speichert und bereitstellt" [FS06, p. 1].

*

"A computer is a machine which manipulates data according to a list of instructions" [English Wikipedia, "Computer", 23.10.2007].

"Ein Computer, auch Rechner genannt, ist ein Apparat, der Informationen mit Hilfe einer programmierbaren Rechenvorschrift verarbeiten kann" [German Wikipedia, "Computer", 23.10.2007].



[FS06]

Application Systems vs. Information Systems

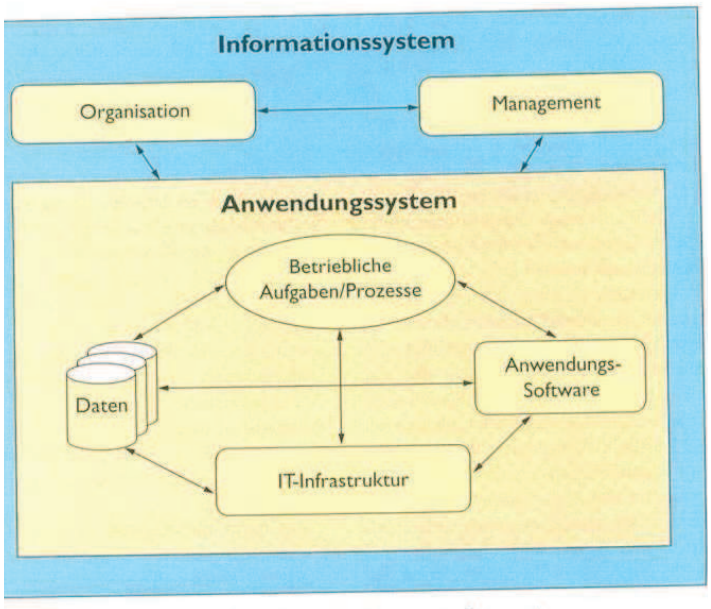
An **Application System** is a set of interoperating

- software programs,
- IT infrastructure and
- data

that supports a specific business domain.

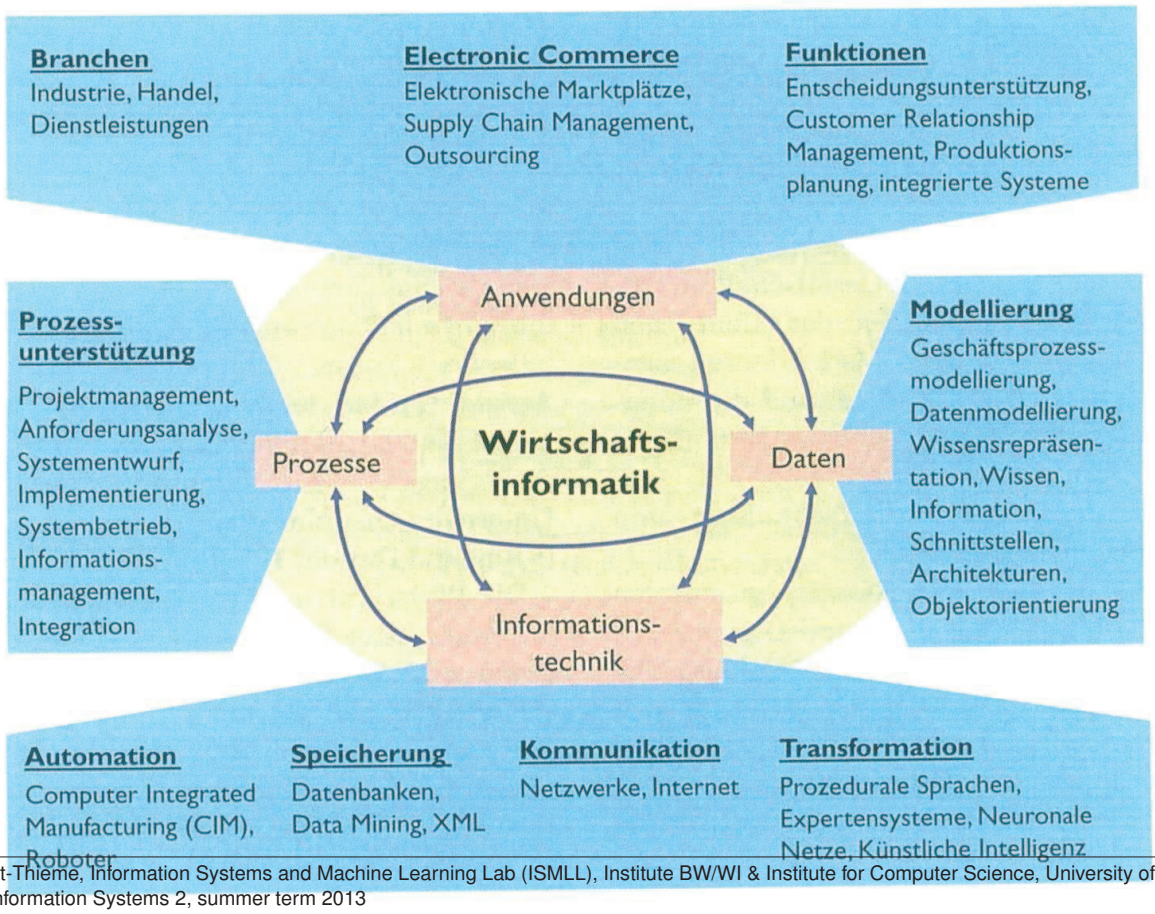
An **Information System** is an application system plus its business context, i.e., the organisation, people, etc. that use the system.

Application systems are **technical systems**, information systems **socio-technical systems**.



[LLS06]

Aspects of Business Information Systems [LLS06]



Software usually not considered to be Part of an Information System

1. **office software**
   — but, companies started to collect all their documents in document warehouses and index them by knowledge bases.

2. **embedded software to operate a machine**
   — but, in many scenarios machines generate some output that may be of further interest and thus should be managed by an information system.

3. **educational software**
   — but, some modern educational software no longer is a monolithic isolated stand-alone piece of software, but connects learners and teachers through an online platform.

4. **entertainment software**

Information Systems Program Contents — GI Recommendation [fI03]

1. **Basics:**
   subdisciplines; relation to business management; law; behavioral sciences; computer industry.

2. **Information and Communication Technology:**
   computer architecture; hardware, software, middleware and development platforms; networks; communication.

3. **Information Management:**
   information as agent of production; information supply; information networks; security; information system architectures.

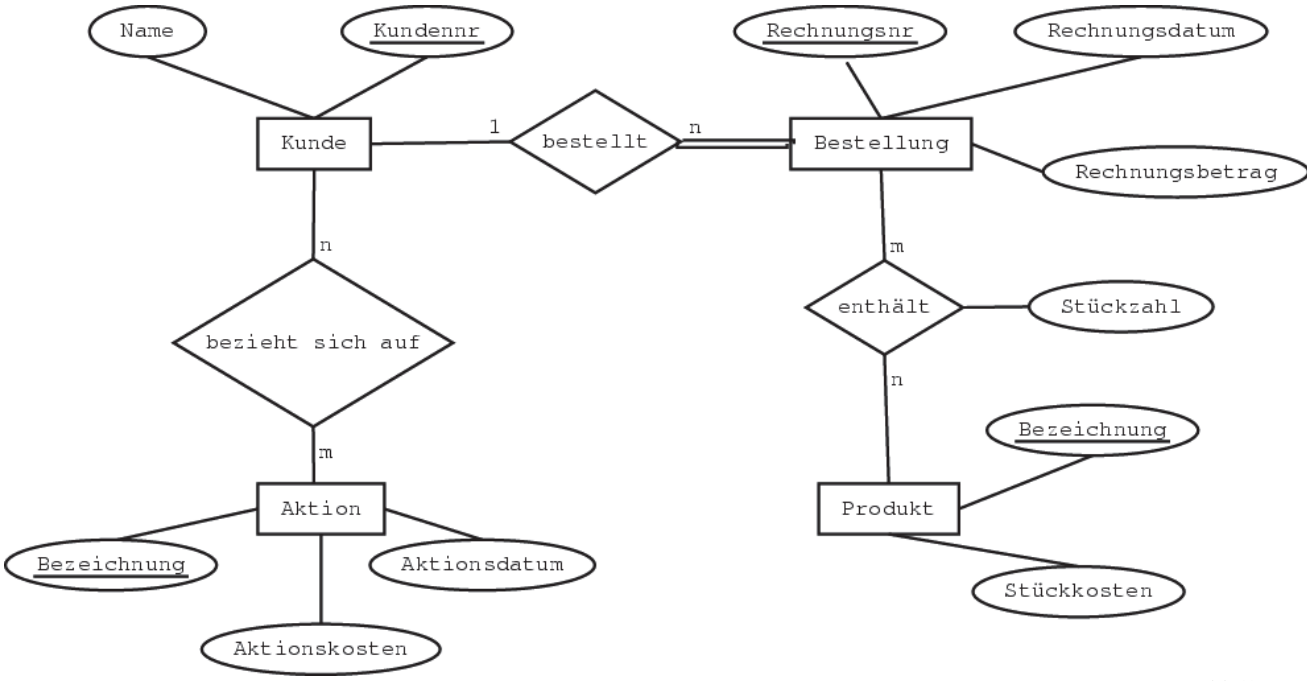
4. **Business Information Systems / E-Commerce & E-Business:**
   information systems oriented at economics sectors; information systems oriented at processes and functions; integration; electronic market places.

5. **Application System Development:**
   analysis, design, implementation, deployment; web-based systems; choice, customization and deployment of standard software; system integration.

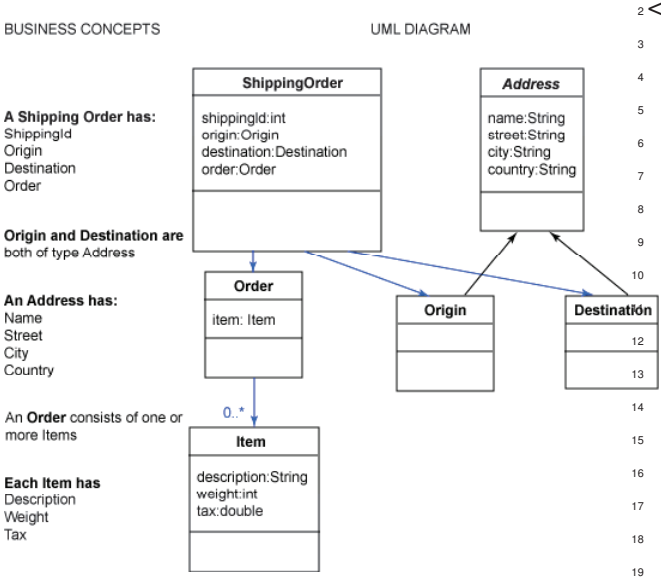
6. **Data and Knowledge:**
   data models and data bases; data warehouse; knowledge representation and engineering.

7. **Disposition and Decision Support:**
   mathematical and statistical models and methods; operations research; artificial intelligence; methods of strategic management.

Modelling Information Systems / Databases

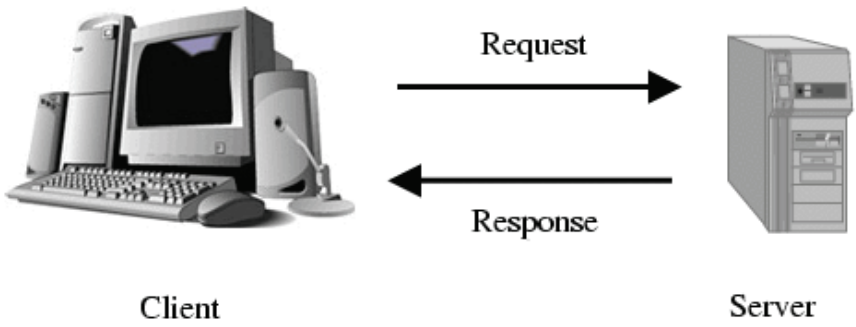


Modelling Information Systems / Extended Markup Language XML




```xml
<?xml version="1.0" encoding="UTF-8"?>
<shippingOrder xmlns:xsi="http://www.w3.org/2001/XMLSch
 xsi:noNamespaceSchemaLocation="C:\schemas\ShippingO
 <shippingId>09887</shippingId>
 <origin>
   <name>Ayesha Malik</name>
   <street>100 Wall Street</street>
   <city>New York</city>
   <country>USA</country>
 </origin>
 <destination>
   <name>Mai Madar</name>
   <street>Liivalaia 33</street>
   <city>Tallinn</city>
   <country>Estonia</country>
 </destination>
 <order>
   <item>
     <description>Ten Strawberry Jam bottles</description>
     <weight>3.141</weight>
     <tax>7.60</tax>
   </item>
 </order>
</shippingOrder>
```

Distributed Information Systems / Remote Invocation



Distributed Information Systems / Web Services

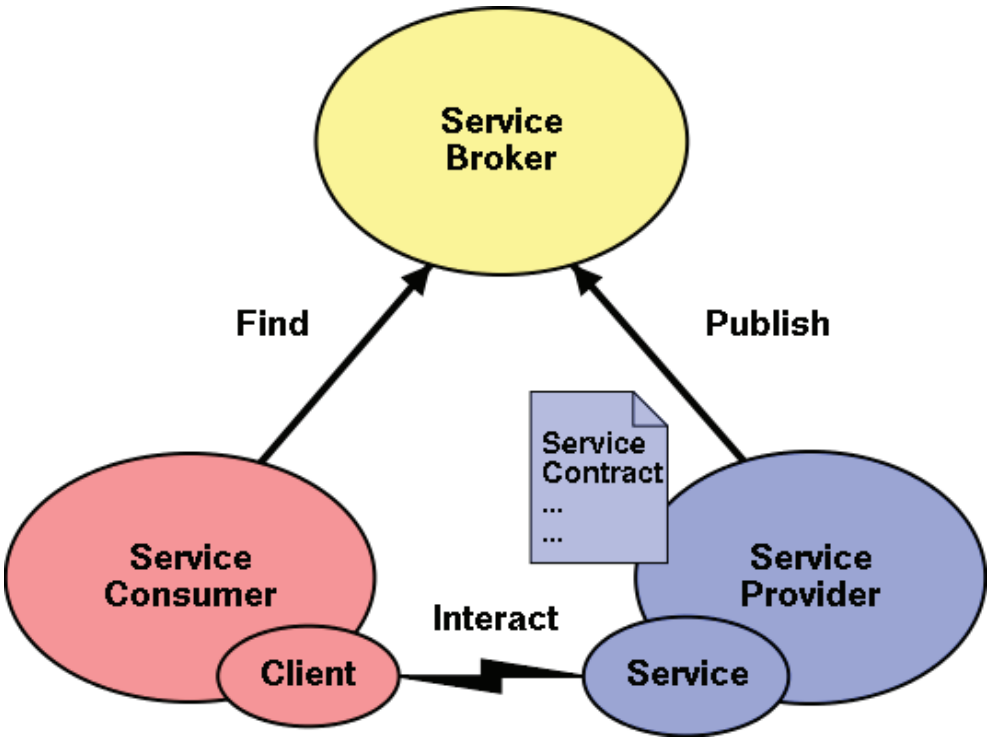


Figure 11: Service oriented architecture [Haa03].

Business Process Modelling / Process Models

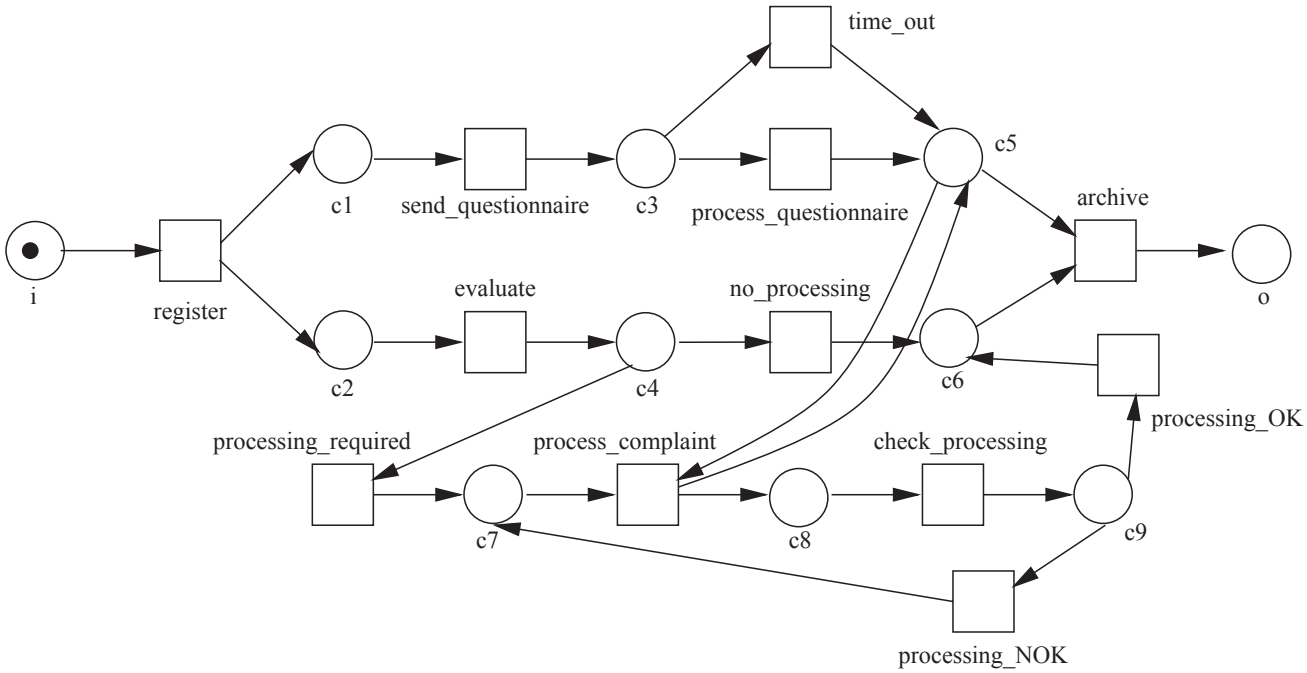


Figure 12: A workflow modeled as Petri net [vdA98].

Business Process Modelling / Process Modelling Languages

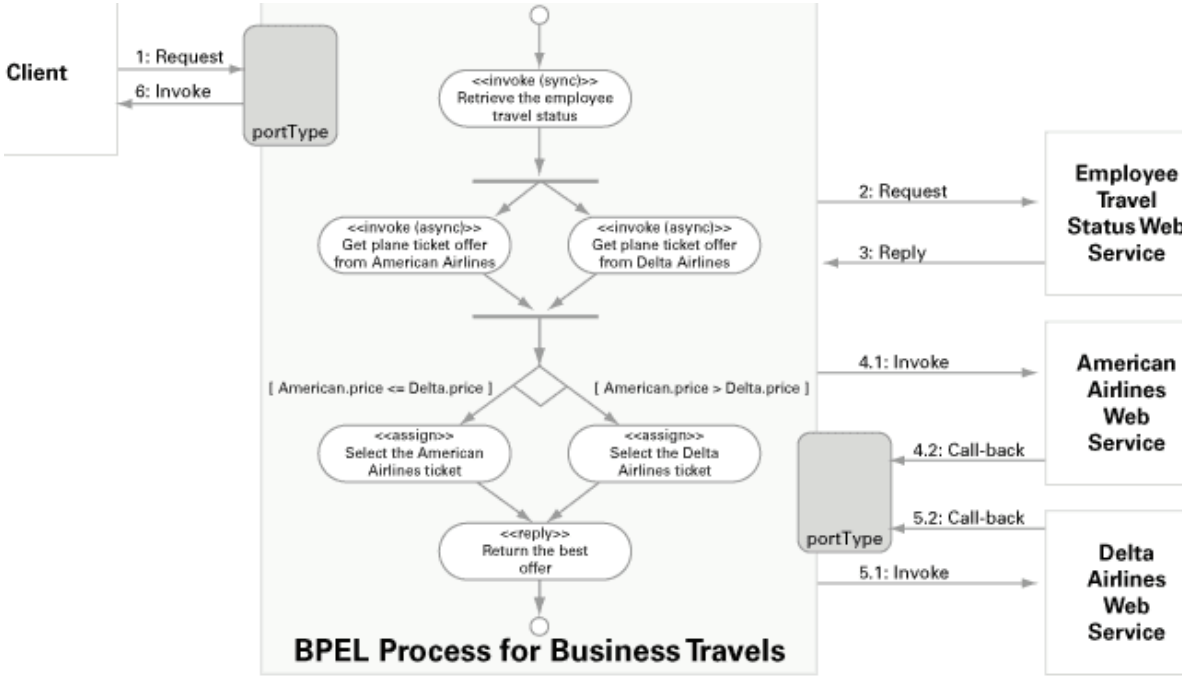
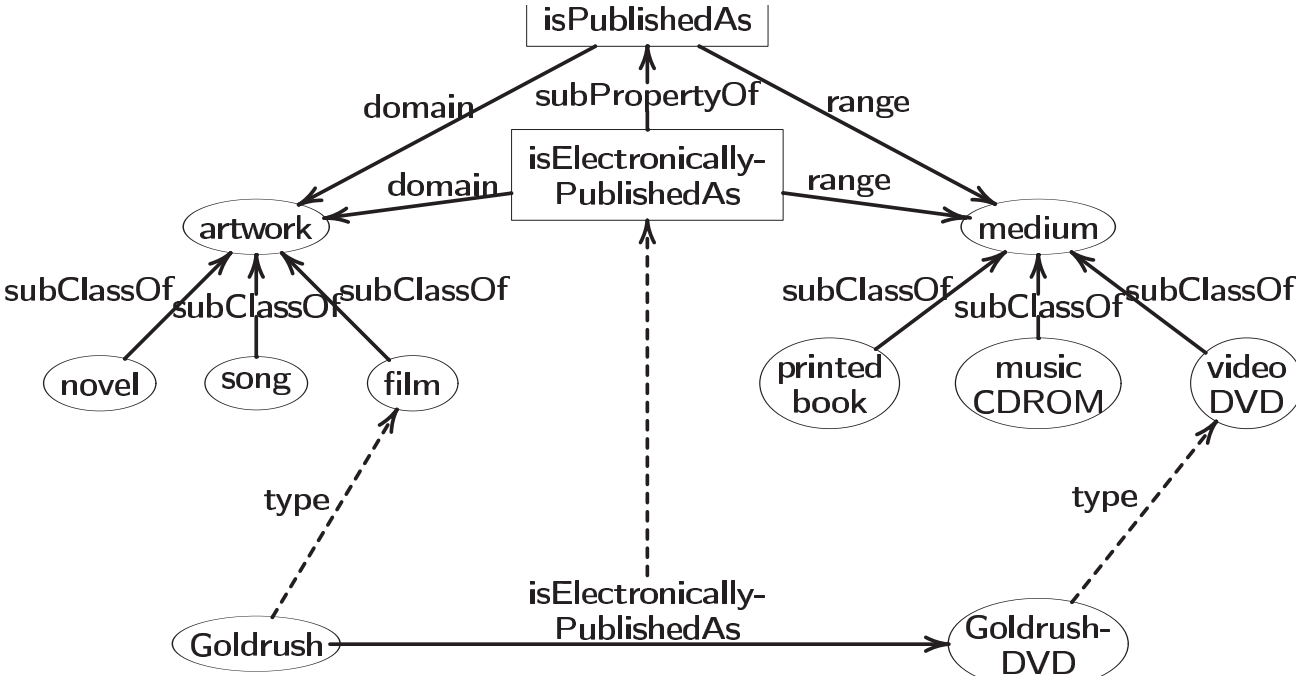


Figure 13: An example business process [Jurar].

Knowledge Management & Semantic Web Technologies



Business Intelligence & Data Mining

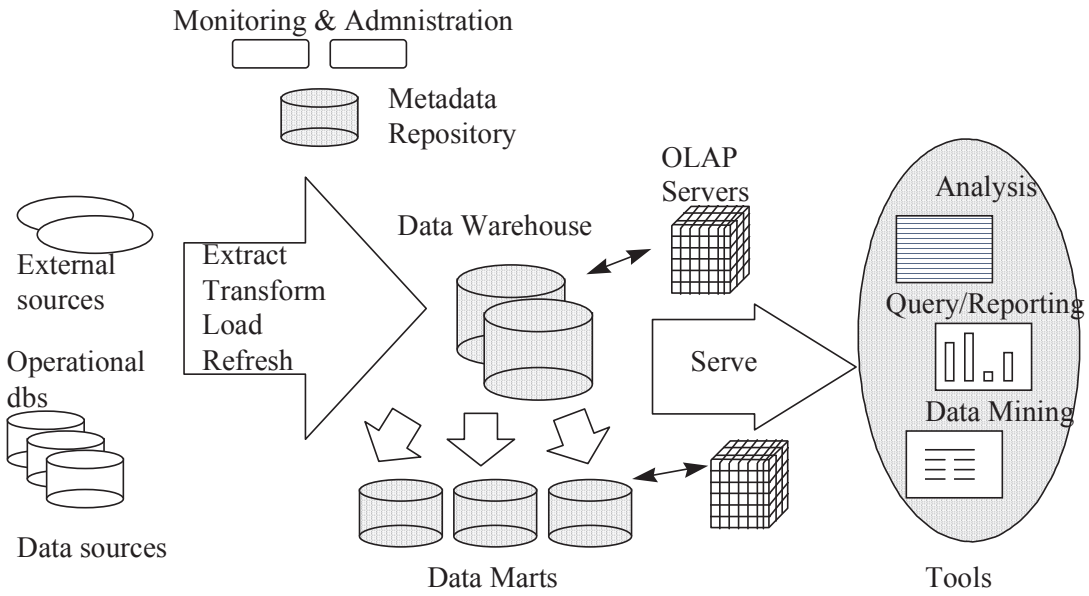


Figure 15: Data Warehouse-Architektur [CD97].

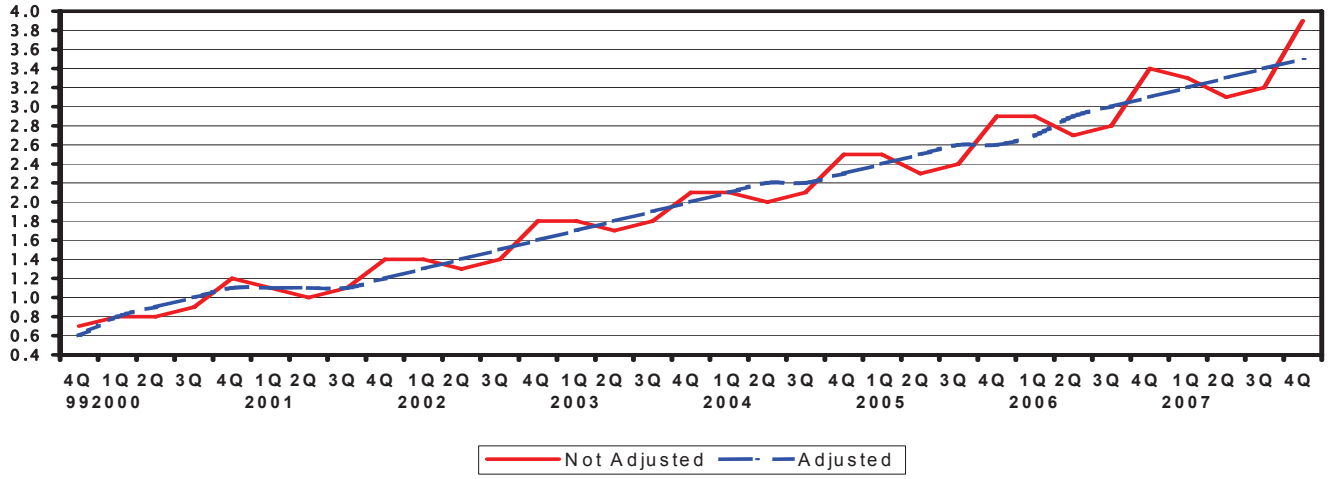


Figure 16: Quaterly Retail E-Commerce Sales (in percent of total retail sales) [SKK08].

1. What are Information Systems?
2. Course Outline
3. Organizational stuff

Exercises and tutorials

- There will be a weekly sheet with two exercises handed out **each Thursday** in the tutorial.
  1st sheet will be handed out Thur. 18.4.
- Solutions to the exercises can be submitted until **next Wednesday 8 am** via email,
  1st sheet is due Wed. 24.4.
- Exercises will be corrected.
- Tutorials **each Thursday 12–14**,
  1st tutorial at Thur. 18.4.
- Successful participation in the tutorial gives up to 10% bonus points for the exam.

Exam and credit points

- There will be a written exam at end of term (2h, 4 problems).
- The exam covers only this course (IS2),
  (In the past, it also covered IS1; this is a separate exam now.)
- The IS2 course gives 6 ECTS (2+2 SWS).
  - ECTS = European Credit Transfer System
  - 1 ECTS $\approx$ 30h workload (for the students)
  - 180h:

14 weeks	à 1.5 h lecture:	21 h
14 weeks	à 1.5 h tutorial:	21 h
	à 5 h solving exercises:	70 h
	à 4 h post preparation:	56 h
once	16h exam preparation:	16 h
total work load:		184 h

Text books

- Kenneth C. Laudon, Jane P. Laudon, Detlef Schoder (^{2}2009): *Wirtschaftsinformatik — Eine Einführung,* Pearson Studium.
- Otto K. Ferstl, Elmar J. Sinz (akt. 2012): *Grundlagen der Wirtschaftsinformatik*, Oldenbourg.
- Franz Lehner, Stephan Wildner, Michael Scholz (^{2}2008): *Wirtschaftsinformatik — Eine Einführung,* Hanser.

Slides will be available online at the course webpage:

http://www.ismll.uni-hildesheim.de/lehre/is2-13s/

References

[CD97] Surajit Chaudhuri and Umeshwar Dayal. An overview of data warehousing and olap technology. *SIGMOD Record*, 26(1):65–74, 1997.

[fI03] Gesellschaft für Informatik. Rahmenempfehlung für die universitätsausbildung in wirtschaftsinformatik. *Informatik Spektrum*, 26/2, 2003.

[FS06] Otto K. Ferstl and Elmar J. Sinz. *Grundlagen der Wirtschaftsinformatik*. Oldenbourg, 5 edition, 2006.

[Haa03] Hugo Haas. Designing the architecture for web services. Technical report, W3C, 2003.

[Jurar] Matjaz B. Juric. A hands-on introduction to bpel. Technical report, Oracle, w/o. year.

[LLS06] Kenneth C. Laudon, Jane P. Laudon, and Detlef Schoder. *Wirtschaftsinformatik — Eine Einführung*. Pearson Studium, 6 edition, 2006.

[SKK08] Scott Scheleuer, Carol King, and David Kinyon. Quaterly retail e-commerce sales 4th quarter 2007. Technical report, US Bureau of Census, 2008.

[vdA98] W.M.P. van der Aalst. The application of petri nets to workflow management. *The Journal of Circuits, Systems and Computers*, 8(1):21–66, 1998.